RECORD OF COMMUNICATION

TO: Grisell Diaz-Cotto

FROM: Addy Michael

SUBJECT: QUALITY ASSURED DATA

Diamond Head Oil site, CLP case # 37351, SDG # B4TM7, 8 water samples were analyzed for only VOA.

REPLY BY: 5/30/2008

PLEASE SIGN BELOW IN ACKNOWLEDGEMENT OF RECEIPT OF THE FOLLOWING VALIDATED DATA AND RETURN A COPY OF THIS RECORD OF COMMUNICATION TO THE RSCC-REGION II, BY INTER-OFFICE MAIL AT EDISON MS-215, OR FAX AT 732-321-6622

COMMENTS:

SIGNATURE: [signature] DATE: 5/27/08

DATE RECEIVED BY EPA-RSCC: _____

299636

RECORD OF COMMUNICATION

REGIONAL SAMPLE CONTROL CENTER

ROC #1

TDF# 08-0459

DATE: 5/5/2008
SUBJECT: CLP Data Package for Quality Assurance Review
FROM: Hazardous Waste Support Section (HWSS)/RSCC
TO: HWSS ESAT-TOPO

Attached is the following ORGANIC Data Package to be reviewed for Quality Assurance

SITE: Diamond Head Oil **CASE #: 37351**

SDG#: B4TM7 **SAMPLER: CH2M**

PROJ. CODE: CO SITE SPILL #: KK	**#SAMPLES**	**MATRIX**
LAB: LIBRTY OPERABLE UNIT: 00	**8**	**Water**
TURN-AROUND-TIME: 21 day		
CERCLIS ID # : NJD092226000	**FRACTION:**	**VOA**

Contaminant(s) of Concern (If known)

REGION II RSCC DATA TRANSFER LOG

Relinquished By		**Received By**	
Signature	**Date/Time**	**Signature**	**Date/Time**
	5/7/08 2 24 PM		5/7/08 2 24 PM
	5/22/08 10 08 AM		5/22/08 10 08 AM
	10 25 AM 5/22/08		5/22/08 10:25 AM
	5/22/08 10:28 AM		5/22/08 10:28 AM
	5/22/08 1:25 PM		5/22/08 1:25 PM
	5/22/08 1:30 PM		5/22/08 1 33 PM
	5/22/08 2 15 PM		5/22/08
	5/22/08 2 30		5/22/08 2 30 PM

SOP HW-33/VOA
Revision 1
August 2007

USEPA Contract Laboratory Program Statement of Work for Organic Analysis of Low/Medium Concentration of VolatileOrganic Compounds SOM01.2 Data Validation

Prepared by: George Karras Date: 8/13/07
George Karras, Chemist
Hazardous Waste Support Section

Peer Reviewed by: Russell Arnone Date: 10/3/07
Russell Arnone, Chemist
Hazardous Waste Support Section

Concurred by: Linda Mavel Date: 10/9/07
Linda Mavel, Chief
Hazardous Waste Support Section

Approved by: Robert Runyon Date: 10/10/07
Robert Runyon, Chief
Hazardous Waste Support Branch

Annual Review

Reviewed by: _____ Date: _____
Name

Reviewed by: _____ Date: _____
Name

TABLE OF CONTENTS

INTRODUCTION

Scope and Applicability

This SOP offers detailed guidance in evaluating laboratory data generated according to the method in the "USEPA Contract Laboratory Program Statement of Work for Organics Analysis Multi-Media, Multi-Concentration, SOM01.1, May 2005". The validation procedures and actions discussed in this document are based on the requirements set forth in the "USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review, January 2005". This document attempts to cover technical problems specific to low/Medium concentration of volatile compounds. Situations may arise where data limitations must be assessed based on the reviewer's own professional judgement.

In addition to technical requirements, contractual requirements may also be covered in this document. While it is important that instances of contract non-compliance be addressed in the Data Assessment, the technical criteria are always used to qualify the analytical data.

Summary

To ensure a thorough evaluation of each result in a data case, the reviewer must complete the checklist within this SOP, answering specific questions while performing the prescribed "ACTIONS" in each section. Qualifiers (or flags) are applied to questionable or unusable results as instructed. The data qualifiers discussed in this document are as follows:

Data Qualifiers

U - The analyte was analyzed for, but was not detected above the reported sample quantitation limit.

J - The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

N - The analysis indicates the presence of an analyte for which there is presumptive evidence to make a "tentative identification."

JN - The analysis indicates the presence of an analyte that has been "tentatively identified" and the associated numerical value represents its approximate concentration.

UJ - The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

R - The sample results are rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

Lab Qualifiers:

D - The positive value is the result of an analysis at a secondary dilution factor.

B - The analyte is present in the associated method blank as well as in the sample. This qualifier has a different meaning when validating inorganic data.

E - The concentration of this analyte exceeds the calibration range of the instrument.

P - Pesticide/Aroclor target analytes when the % Difference between the analyte concentrations obtained from the two dissimilar GC columns is greater than 25%.

The reviewer must prepare a detailed data assessment to be submitted along with the completed SOP checklist. The Data Assessment must list all data qualifications, reasons for qualifications, instances of missing data and contract non-compliance.

Reviewer Qualifications:

Data reviewers must possess a working knowledge of the USEPA Statement of Work SOM01.2 and National Functional Guidelines mentioned above.

YES NO N/A

. . . . . .

PACKAGE COMPLETENESS AND DELIVERABLES

CASE NUMBER: 37351 LAB: COMPUCHEM / LIBERTY.

SITE NAME: DIAMOND HEAD OIL SDG No(s).: B4TM7-

1.0 Chain of Custody and Sampling Trip Reports

1.1 Are the Traffic Reports/Chain-of-Custody Records present for all samples? [✓] ___ ___

ACTION: If no, contact RSCC, or the TOPO to obtain replacement of missing or illegible copies from the lab.

1.2 Is the Sampling Trip Report present for all samples? [✓] ___ ___

ACTION: If no, contact either RSCC or ask the TOPO to obtain the necessary information from the prime contractor.

2.0 Data Completeness and Deliverables

2.1 Have any missing deliverables been received and added to the data package? [✓] [ ] ___

ACTION: Contact the TOPO to obtain an explanation or resubmittal of any missing deliverables from the lab. If lab cannot provide them, note the effect on the review of the data package in the Contract Problems/Non-compliance section of the Data Assessment.

2.2 Was CLASS CCS checklist included with the package? [✓] ___ ___

	YES	NO	N/A
. . . . .			
2.3 Are there any discrepancies between the Traffic Reports/Chain-of-Custody Records, and Sampling Trip Report?		[✓]	

ACTION: If yes, contact the TOPO to obtain an explanation or resubmittal of any missing deliverables from the laboratory.

3.0 Cover Letter SDG Narrative

3.1 Is the SDG Narrative or Cover Letter Present?	[✓]		
3.2 Are case number, SDG number and contract number contained in the SDG Narrative or cover letter (see SOW, Exhibit B, section 2.5.1)? EPA sample numbers in the SDG, detailed documentation of any quality control, sample, shipment, and/or analytical problems encountered in processing the samples? Corrective action taken?	[✓]		
3.3 Does the Narrative contain the following information SOM01.1, page B-12, section 2.5.1)? Description of trap, column used, storage of samples, case#, SDG#, analytical problems, and discrepancies between field and lab weights.	[✓]		
3.4 Does the narrative, VOA section, contain a list of all TICs identified as alkanes and their estimated concentrations?	[✓]		
3.5 Did the contractor record the temperature of the cooler on the Form DC-1, Item 9 - Cooler Temperature, and in the SDG Narrative?	[✓]		
3.6 Does the narrative contain a list of the pH values determined for each water sample submitted for volatiles analysis (SOW, page B-13, section 2.5.1.2)?	[ ]		

	YES	NO	N/A
3.7 Does the Case Narrative contain the "verbatim" statement (page B-12, section 2.5.1 of the SOM)?	[✓]	___	___

ACTION: If "No", to any question in this section, contact the TOPO to obtain necessary resubmittals. If unavailable, document under the Contract Problems/ Non-Compliance section of the Data Assessment.

4.0 Data Validation Checklist

4.1 Check the package for the following (see SOM reporting requirements, section 2.1, page B-10):

a. Is the package paginated in ascending order starting from the SDG narrative?	[✓]	___	___
b. Are all forms and copies legible?	[✓]	___	___
c. Assembled in the order set forth in the SOW?	[✓]	___	___
Low/Med Concentration Volatiles Data present?	[✓]	___	

Action: Take action as specified in section 3.7 above.

PART A: Low/Medium Volatile ANALYSES

1.0 Sample Conditions/Problems

1.1 Do the Traffic Reports/Chain-of-Custody Records, Sampling Trip Report or Lab Narrative indicate any problems with sample receipt, condition of samples, analytical problems or special circumstances affecting the quality of the data?	___	[✓]	___

ACTION: If samples were not iced or the ice was melted upon arrival at the laboratory and the temperature of the

YES NO N/A

cooler was > 10° C, then flag all positive results with a "J" and all non-detects "UJ".

ACTION: If both VOA vials for a sample have air bubbles or the VOA vial analyzed had air bubbles, flag all positive results "J" and all non-detects "R".

2.0 Holding Times

2.1 Have any VOA technical holding times, determined from date of collection to date of analysis, been exceeded? ___ N ___

2.2 Preservation: Aqueous samples must be preserved with HCL to pH of 2 or below and cooled at 4°C ± 2°C. Non-aqueous samples: frozen (less than -7°C) or properly cooled (4°C ± 2°C) and preserved with $NaHSO_4$.

Action: Qualify sample results according to the following table.

Holding Time Actions for Low/Medium Volatile Analyses

Matrix	Preserved	Criteria	ACTION	
			Detected Associated Compounds	Non-Detected Associated Compounds
Aqueous	No	≤ 7 Days	NO Action	
	No	> 7 Days	J	R
	Yes	≤ 14 Days	No Action	
	Yes	> 14 Days	J	R
Non-Aqueous	No	≤ 14 Days	J	R
	Yes	≤ 14 Days	No Action	
	Yes/No	> 14 Days	J	R

3.0 Deuterated Monitoring Compound (DMC) Recovery (Form II)

	YES	NO	N/A
3.1 Are the Volatile SMC Recovery Summaries (Form II present?	[✓]	___	___

ACTION: Contact the TOPO to obtain an explanation/resubmittal from the lab. If missing deliverables are unavailable, document the effect in the Data Assessment.

3.2 Were outliers marked correctly with an asterisk?	[✓]	___	___

ACTION: Circle all outliers in red.

3.3 Were more than three of the fourteen (14) Deuterated Monitoring Compounds (DMC's) recoveries outside their corresponding limits?	___	[✓]	___
If yes, were samples re-analyzed?	[ ]	___	✓
Were method blanks re-analyzed?	[ ]	___	✓

ACTION: If any DMC is outside the required limits (see Table below), qualify their associated target compounds (See Table below) as follows:

VOLATILE DMC AND THEIR ASSOCIATED TARGET COMPOUNDS

Chloroethane-d5	**1,2-Dichloropropane-d6**	**1,2-Dichlorobenzene-d4**
Dichlorodifluoromethane	Cyclohexane	Chlorobenzene
Chloromethane	Methylcyclohexane	1,3-Dichlorobenzene
Bromomethane	1,2-Dichloropropane	1,4-Dichlorobenzene
Chloroethane	Bromodichloromethane	1,2-Dichlorobenzene
Carbon Disulfide		1,2,4-Trichlorobenzene
		1,2,3-Trichlorobenzene

YES NO N/A

. . . . . .

1,4-Dioxane-d8 1,4-Dioxane	**trans-1,3-Dichloropropene-d4** cis-1,3-Dichloropropene trans-1,3-Dichloropropene 1,1,2-Trichloroethane	**Chloroform-d** 1,1-Dichloroethane Bromochloromethane Chloroform Dibromochloromethane Bromoform
2-Butanone-d5 Acetone 2-butanone	**1,1-dichloroethene-d2** 1,1-dichloroethene trans-1,2-Dichloroethene cis-1,2-Dichloroethene	**2-Hexanone-d5** 4-Methyl-2-pentanone 2-Hexanone
Vinyl Chloride-d3 Vinyl Chloride	**Benzene-d6** Benzene	**1,1,2,2-Tetrachloroethane-d2** 1,1,2,2-Tetrachloroethane 1,2-Dibromo-3-chloropropane
1,2-Dichloroethane-d4 Trichlorofluoromethane 1,1-Dichloroethene 1,1,2-Trichloro-1,2,2-trifluoroethane Methyl Acetate Methylene Chloride Methyl tert-Butyl Ether Carbon Tetrachloride 1,2-Dichloroethane 1,1,1-Trichloroethane 1,2-Dibromoethane	**Toluene-d8** Trichloroethene Toluene Tetrachloroethene Ethylbenzene o-Xylenes m,p-Xylene Styrene Isopropylbenzene	

VOLATILE DEUTERATED MONITORING COMPOUND RECOVERY LIMITS

DMC	Recovery Limits (%) for Water Samples	Recovery Limits (%) for Soil samples
Vinyl Chloride-d3	65 - 131	68 - 122
Chloroethane-d5	71 - 131	61 - 130
1,1-Dichloroethene-d2	55 - 104	45 - 132
2-Butanone-d5	49 - 155	20 - 182
Chloroform-d	78 - 121	72 - 123
1,2-Dichloroethane-d4	78 - 129	79 - 122
Benzene-d6	77 - 124	80 - 121
1,2-Dichloropropane-d6	79 - 124	74 - 124
Toluene-d8	77 - 121	78 - 121
trans-1,3-Dichloropropene-d4	73 - 121	72 - 130
2-Hexanone-d5	28 - 135	17 - 184
1,4-Dioxane-d8	50 - 150	50 - 150
1,1,2,2-Tetrachloroethane-d2	73 - 125	56 - 161
1,2-Dichlorobenzene-d4	80 - 131	70 - 131

1. For any recovery greater than the upper limit:

   a. Qualify "J" all positive associated target compounds.
   b. Do not qualify associated non-detects.

2. For any recovery greater than or equal to 20%, but less than the lower limit:

   a. Qualify "J" all positive associated target compounds.
   b. Qualify "UJ" associated non-detects.

3. For any recovery less than 20%:

YES NO N/A

a. Qualify "J" all positive associated target compounds.
b. Qualify "R" all associated non-detects.

NOTE: Up to three (3) DMC's per sample, excluding 1,4-Dioxane-d8, may fail to meet the recovery limits. (SOM, sec. 11.3.4, pg. D-45/Low Medium VOA). Recovery limits for 1,4-Dioxane-d8 are advisory.
As per SOM, any sample which has more than 3 DMC's outside the limits, it must be reanalyzed (SOM sec. 11.4.3.1 pg. D-46/Low Medium VOA).

ACTION: Note in the Data Assessment under Contract Problems/ Non-Compliance if the Lab did not perform reanalysis.

3.4 Are there any transcription/calculation errors between raw data and form II? ___ [ ] /

ACTION: If large errors exist, ask the TOPO to obtain an explanation/resubmittal from the lab, make any necessary corrections and note errors in the data assessment.

Note: DMC recovery limits criteria and qualifications apply to samples diluted 5X and less. For samples diluted greater than 5X, recovery criteria does not apply because it is assumed DMC is diluted below the quantitation range.

4.0 Matrix Spike/Matrix Spike Duplicate Recovery (Form III)

Note: Data for MS/MSD will not be present unless requested.

4.1 Are the MS/MSD Recovery Forms (Form III Low/Med VOA) present? [ ] ___ /

4.2 Was the MS/MSD analyzed at the required frequency (once per SDG, or every 20 samples, whichever is more frequent)? [ ] ___ /

ACTION: If any MS/MSD data are missing, take action as specified in section 3.1 above.

ACTION: No action is taken on MS/MSD data alone. However, using professional judgement, the validator may

YES NO N/A

. . . . . .

use the MS and MSD results in conjunction with other QC criteria and determine the need for some qualification of the data. If any MS/MSD % recovery or RPD is out of specification, qualify data to include the consideration of the existence of interference in the raw data. Consideration include, but not limited to the following "Action":

Criteria	Action	
	Detected Spiked Compounds	Non-detected Spiked Compounds
%R or RPD > Upper Acceptance Limit	J	No qualification
20% ≤ %R < Lower Acceptance Limit	J	UJ
%R < 20%	J	Use Professional Judgement
Lower Acceptance Limit ≤ %R; RPD ≤ Upper Acceptance Limits	No qualification	

5.0 Method Blanks (Form IV)

5.1 Is the Volatile Method Blank Summary (Form IV VOA) present for aqueous and soil samples? [✓] ___ ___

5.2 Frequency of Analysis: For the analysis of Low/ Med Concentration VOA TCL compounds, has a method blank been analyzed for each SDG or every 20 samples, whichever is more frequent? [✓] ___ ___

5.3 Has a VOA method blank been analyzed after the calibration standards and once every 12 hours time period for each GC/MS instrument used? [✓] ___ ___

5.4 Was a VOA instrument blank analyzed after each sample/dilution that contains a target compound exceeding the initial calibration range (see SOM, page D-48/Low/Medium VOA, section 12.1.1.3)? [ ] ___ [✓]

YES NO N/A

. . . . . .

ACTION: If any method/instrument blank data are missing, notify the TOPO to obtain resubmittals or an explanation from the lab. If method blank data are unavailable, the reviewer may use professional judgement, or substitute field blank or trip blank data for missing method blank data.

If an instrument blank was not analyzed after a sample containing a target analyte exceeding the initial calibration standards, inspect the sample chromatogram acquired immediately after this sample for possible carryover. The system is considered uncontaminated if the target analyte is below CRQL. Use professional judgement to determine if carryover occurred and qualify analyte(s) accordingly.

5.5 Was a storage blank analyzed once per SDG after all the samples were analyzed? [✓] ___ ___

ACTION: If storage blank data is missing, contact the TOPO to obtain any missing deliverables from the laboratory. If unavailable, note in the Contract Problems/Non-Compliance section of the Data Assessment.

5.6 The validator should verify that the correct identification scheme for EPA blanks was used. (See SOM page B-39, section 3.3.7.3 for more information.)

Was the correct identification scheme used for all Low/Med VOA blanks? [✓] ___ ___

ACTION: Contact the TOPO to obtain corrections from the lab, or make the necessary corrections. Document in the "Contract Problems/Non-Compliance section of the Data Assessment all corrections made by the validator.

5.7 Chromatography: review the blank raw data - chromatograms (RICs), quant. reports, data system printouts and spectra.

Also compare the storage blank raw data with the method blank. Determine if contamination in the storage blank is also present in the method blank.

	YES	NO	N/A
Is the chromatographic performance (baseline stability) for each instrument acceptable for Trace VOAs?	☑	___	___

ACTION: Use professional judgement to determine the effect on the data.

5.8	Are all detected hits for target compounds in method, and storage blanks less than the CRQL?	☑	___	___

Exception: Methylene Chloride, Acetone and 2-butanone must be less than 2X times their respective CRQLs.

ACTION: If no, an explanation and laboratory's corrective actions must be addressed in the case narrative. If the narrative contains no explanation, then make a note in the Contract Problems/Non-Compliance section of the Data Assessment.

6.0 Contamination

NOTE: "Water blanks", "drill blanks", and distilled water blanks" are validated like any other sample, and are not used to qualify data. Do not confuse them with the other QC blanks discussed below.

6.1	Does the storage blank contain positive results (TCL and/or TICs) for Low/Med Concentration VOAs?	___	☑	___

SA 5/21/08

6.2	Do any method/reagent/instrument blanks contain positive results (including TICs) for Low/Med Concentration VOAs?	✓	☐	___

NOTE: Contaminated instrument blanks are unacceptable under this SOW (see page D-50/VOA, section 12.1.5.2).

ACTION: Document in the Data Assessment under Contract Problems/Non-Compliance if a contaminated instrument blank was submitted.

YES NO N/A

. . . . . .

ACTION: Sample analysis results after the high concentration sample must be evaluated for carryover. Sample must meet the maximum carryover criteria as listed in SOM sec. 11.3.8 p. D-46/VOA. ("the sample must not contain a concentration above the CRQL for the target compounds that exceeded the limit in the contaminated sample.")

6.3 Do any field/trip/rinse blanks have positive hits for Low/Med VOA results (including TICs)? ✓ [ ] ___

ACTION: Prepare a list of the samples associated with each of the contaminated blanks. (Attach a separate sheet.)

NOTE: All field blank results associated with a particular group of samples (may exceed one per case) must be used to qualify data. Trip blanks are used to qualify only those samples with which they were shipped. Blanks may not be qualified because of contamination in another blank. Field blanks & trip blanks must be qualified for system monitoring compound, instrument performance criteria, spectral or calibration QC problems.

ACTION: Follow the directions in the table below to qualify TCL results due to contamination. Use the largest value from all the associated blanks. If any blanks are grossly contaminated, all associated sample data should be qualified unusable (R).

Blank Type	Blank Result	Sample Result	Action for Samples
Method, Field, Trip, Storage,	Detects	Not detected	No qualification required
	< CRQL *	< CRQL*	Report CRQL value with a U
		≥ CRQL*	No qualification required
	= CRQL *	< CRQL)*	Report CRQL value with a U
		≥ CRQL*	No qualification required
		< CRQL*	Report CRQL value with a U

YES NO N/A

Instrument **	> CRQL *	≥ CRQL* and < blank contamination	Report concentration of sample with a U
		≥ CRQL* and ≥ blank contamination	No qualification required
	Gross contamination	Detects	Qualify results as unusable R
	TIC > 2ug/L	Detects	See "Action" below

* 2x the CRQL for methylene chloride, 2-butanone and acetone

** Qualifications based on instrument blank results affect only the sample analyzed immediately after the sample that has target compounds that exceed the calibration range or non-target compounds that exceed 100 ug/L.

NOTE: Analytes qualified "U" for blank contamination are treated as "hits" when qualifying for calibration criteria.
Note: When applied as described in the table above, the contaminant concentration in the blank are multiplied by the sample dilution factor.

ACTION : For TIC compounds, if the concentration in the sample is less than five times the concentration in the most contaminated associated blank, flag the sample data "R" (unusable).

6.4 Are there field/rinse/equipment blanks associated with every sample? ☑ ___ ___

ACTION: Note in data assessment that there is no associated field/rinse/equipment blank.

Exception: samples taken from a drinking water tap do not have associated field blanks.

7.0 GC/MS Instrument Performance Check (Form V)

	YES	NO	N/A
7.1 Are the GC/MS Instrument Performance Check Forms (Form V) present for Bromofluorobenzene (BFB)?	[1]	___	___
7.2 Are the enhanced bar graph spectrum and mass/charge (m/z) listing for the BFB provided for each twelve hour shift?	[1]	___	___
7.3 Did the 12-hour clock begin with either the injection of BFB, or in cases where a closing continuing calibration (CCV) was used as an opening CCV?	[1]	___	___

Listed below are some, but not necessarily all, examples of acceptable analytical sequences incorporating the use of the opening/closing CCV. Use these examples as a guide for possible analytical sequences that can be expected.

Conditions for When Example Sequence is Appropriate:	**Acceptable Criteria That Must be Met:**	**Notes:**
If time remains on the 12 hour clock after initial calibration sequence	• BFB tunes meet instrument performance criteria. • The five initial calibration standards meet initial calibration criteria. • CCV A meets both opening and closing CCV criteria • CCV B meets closing CCV criteria.	The requirement of starting the new 12-hr clock for Analytical Sequence 2 with a new BFB tune is waived if CCV A meets opening CCV criteria. If CCV B meets opening CCV criteria, a method blank and subsequent samples may be analyzed immediately after CCV B.
If time remains on the 12 hour clock after initial calibration sequence	• BFB tunes meet instrument performance criteria. • The five initial calibration standards meet initial calibration criteria. • CCV A meets closing CCV criteria (but does not meet opening CCV criteria). • CCV B meets opening CCV criteria. • CCV C meets closing CCV Criteria.	CCV A does not meet opening criteria, therefore a new BFB tune must be performed, immediately followed by CCV B before a method blank and any samples may be analyzed. In this case, the new 12 hr clock and Analytical Sequence 2 begins with the injection of the new BFB tune.

YES NO N/A

If more than 12 hrs have elapsed since the most recent initial calibration or closing CCV. OR If the most recent closing CCV was not or could not be used as an opening CCV.	• BFB tunes meet instrument performance criteria. • CCV A meets opening CCV criteria. • CCV B meets both opening and closing CCV criteria. • CCV C meets both opening and closing CCV criteria.	The requirement of starting the new 12 hour clock for Analytical Sequence 2 with a new BFB tune is waived if CCV B meets opening CCV criteria. If CCV C meets opening CCV criteria, a method blank and subsequent samples may be analyzed immediately after CCV B.
If more than 12 hrs have elapsed since the most recent initial calibration or closing CCV OR If the most recent closing CCV was not or could not be used as an opening CCV	• BFB tunes meet instrument performance criteria. • CCV A meets opening CCV criteria. • CCV B meets closing CCV criteria (but does not meet opening CCV criteria). • CCV C meets opening CCV Criteria. • CCV D meets both opening and closing CCV criteria.	CCV B does not meet opening CCV criteria, therefore a new BFB tune must be performed, immediately followed by CCV B before a method blank and any samples may be analyzed. In this case, the new 12 hr clock and Analytical Sequence 2 begins with the injection of the new BFB tune. The requirement of starting the new 12 hr clock for Analytical Sequence 3 with a new BFB tune is waived if CCV D meets opening CCV criteria. If CCV D meets opening criteria, a method blank and subsequent samples may be analyzed after CCV B.

7.4 Have the ion abundances been normalized to m/z 95 [✓] ___ ___

NOTE: All ion abundance ratios must be normalized to m/z 95, the nominal base peak, even though the ion abundance of m/z 174 may be up to 120% that of m/z 95.

ACTION: If mass assignment is in error, qualify all associated data as unusable (R).

7.5 Have the ion abundance criteria been met for each instrument used? [✓] ___ ___

ACTION: List all data which do not meet ion abundance criteria (attach a separate sheet).

ACTION: If ion abundance criteria are not met, professional Judgement may be applied to determine to what extent the data may be utilized.

	YES	NO	N/A
7.6 Are there any transcription/calculation errors between mass lists and Form Vs? (Check at least two values but if errors are found, check more.)		✓	
7.7 Is the number of significant figures for the reported relative abundances consistent with the number given in the ion abundance criteria column on Form V ?	✓		

ACTION: If large errors exist, take action as specified in section 3.1 above.

7.8 Is the spectrum of the mass calibration compound acceptable?	✓		

ACTION: Use professional judgement to determine whether associated data should be accepted, qualified, or rejected.

8.0 Target Compound List (TCL) Analytes (Form I)

8.1 Are the Organic Analysis Data Sheets (Form I) present with required header information on each page, for each of the following:			
a. Samples and/or fractions as appropriate?	✓		
b. Regional Control/MS/MSD samples?			✓
c. Blanks (method, trip, etc)?	✓		
8.2 Are the VOA Reconstructed Ion Chromatograms, the mass spectra for the identified compounds, and the data system printouts (Quant Reports) included in the sample package for each of the following:			
a. Samples and/or fractions as appropriate?	✓		
b. Regional Control/MS/MSD samples?			✓
c. Blanks (method, trip, etc)?	✓		

ACTION: If any data are missing, take action specified in 3.1 above.

8.3 Is chromatographic performance acceptable with respect to:			
Baseline stability?	✓		
Resolution?	✓		
Peak shape?	✓		
Full-scale graph (attenuation)?	✓		

	YES	NO	N/A
. . . . .			
Other: _____?	[ ]	___	[✓]

ACTION: Use professional judgement to determine the acceptability of the data.

8.4 Are lab-generated standard mass spectra of the identified VOA compounds present for each sample? [✓] ___ ___

ACTION: If any mass spectra are missing, take action as specified in 3.1 above. If lab does not generate their own standard spectra, make note under the "Contract Problems/Non-Compliance" section of the Data Assessment. If spectra are unavailable reject "R" the reported results.

8.5 Is the RRT of each reported compound within ± 0.06 RRT units of the standard RRT in the continuing calibration? [✓] ___ ___

8.6 Are all ions present in the standard mass spectrum at a relative intensity greater than 10% also present in the sample mass spectrum? [✓] ___ ___

8.7 Do sample and standard relative ion intensities agree to within ± 20%? [✓] ___ ___

ACTION: Use professional judgement to determine acceptability of data. If it is determined that incorrect identifications were made, all such data should be rejected (R) flagged "N" (presumptive evidence of the presence of the compound) or changed to not detected (U) at the calculated detection limit. In order to be positively identified, the data must comply with the criteria listed in sections 8.4-8.7 above.

ACTION: When sample carry-over is suspected, review section 6.2/Action #2 above before determining if instrument cross-contamination has affected positive compound identifications.

9.0 Tentatively Identified Compounds (TIC)

9.1 Are all Tentatively Identified Compound Forms (Form I VOA-TIC) present? Do listed TICs include scan number or retention time, as well as the estimated "J" and/or "JN" qualifier? [✓] ___ ___

9.2 Are the mass spectra for the tentatively identified compounds and associated "best match" spectra included in the sample package for each of the following:

a. Samples and/or fractions as appropriate? [✓] ___ ___

	YES	NO	N/A
b. Blanks?	[ ]		✓
b. Are Alkanes listed in/or part of the Case Narrative?	[✓]		

ACTION: If any TIC data are missing, take action specified in 3.1 above.

ACTION: Verify "JN" qualifier is present for all chemically named TICs having a percent match of greater than or equal 85%. TICs labeled "unknown" are qualified with a "J" qualifier.

9.3 Are any target compounds (from any fraction) listed as TICs? (Example: 1,2-dimethylbenzene is xylene - a VOA target analyte - and should not be reported as a TIC.)		[✓]	

ACTION: Flag with "R" only target compound detected in another fraction (except blank contamination).

9.4 Are all ions present in the reference mass spectrum with a relative intensity greater than 10% also present in the sample mass spectrum?	[✓]		
9.5 Do TICs and "best match" reference spectra relative ion intensities agree within ± 20%?	[✓]		

ACTION: Use professional judgement to determine the acceptability of TIC identifications. If it is determined that an incorrect identification was made, change its identification to "unknown" or to some less specific identification (example: "C3 substituted benzene") as appropriate.

Action: When a compound is not found in any blank, but is detected in a sample and is a suspected artifact of a common laboratory contaminant, solvent preservatives or Aldo condensation, the result should be qualified as unusable (R). (i.e., common lab contaminants such as CO_2(m/e 44), Siloxanes (m/e 73), diethyl ether, hexane, certain freons. Aldol condensation products: 4-hydroxy-4-methyl-2-pentanone, 4-methyl-2-penten-2-one, and 5,5-dimethyl-2(H)-furanone. Solvent preservatives cyclohexene, and related by-products: cyclohexanone, cyclohexenone, cyclohexanol, cyclohexenone, chlorocyclohexene, and chlorocyclohexanol.).

10.0 <u>Compound Quantitation and Reported Detection Limits</u>

10.1 Are there any transcription/calculation errors in Form I results? (Check at least two positive values. Verify that the correct internal standards, quantitation ions, and RRFs were used to calculate Form I results.)		[✓]	
10.2 Are the CRQLs adjusted to reflect sample dilutions and per cent moisture?	[✓]		

YES NO N/A

. . . . . .

ACTION: If errors are large, take action as specified in section 3.1 above.

ACTION: When a sample is analyzed at more than one dilution, the lowest CRQLs are used (unless a QC exceedance dictates the use of the higher CRQLs data from the diluted sample). Replace concentrations that exceed the calibration range in the original analysis by crossing out the "E" and its corresponding value on the original Form I and substituting the data from the diluted sample. Specify which Form I is to be used, then draw a red "X" across the entire page of all Form I's not to be used, including any in the data summary package.

!0.3 For non-aqueous samples, were the percent moisture < 70%? [ ] ___ ✓

Action: If the % moisture ≥ 70.0% and < 90.0%, qualify detects as "J" and non-detects as approximated "UJ" If the % Moisture ≥ 90%, qualify detects as "J" and non-detects as "R"

11.0 Standards Data (GC/MS)

11.1 Are the reconstructed ion chromatograms, and data system printouts (quant. reports) present for each initial and continuing calibration? [✓] ___ ___

ACTION: If any calibration standard data are missing, take action specified in section 3.1 above.

12.0 GC/MS Initial Calibration (Form VI)

12.1 Are the Initial Calibration Forms (Form VI LCV) present and complete for the volatile fraction at concentrations of 5, 10, 50, 100, and 200 µg/ℓ for non-ketones, 10, 20, 100, 200 and 400 ug/L for ketones and 100, 200, 1000, 2000, and 4000 ug/L for 1,4-dioxane. [✓] ___ ___

ACTION: If any Initial Calibration forms are missing, take action as specified in section 3.1 above.

12.2 Are the relative standard deviation (RSD) stable for VOA's over the concentration range of the calibration (i.e., %RSD ≤ 20.%, ≤ 40% for poor performers (see table below), ≤ 50% for 1,4-dioxane)? [ ] ✓ ___

ACTION: Circle all outliers in red.

NOTE: The twenty two (22) poor performers compounds and associated DMCs are listed below. The relative response factor (RRF) for these compounds must be greater than or equal to 0.010.

YES NO N/A

Volatile Compounds Exhibiting Poor Response

Volatile Compounds	
Acetone	1,2-Dibromo-3-chloropropane
2-Butanone	Isopropylbenzene
Carbon disulfide	Methyl acetate
Chloroethane	Methylene chloride
Chloromethane	Methylcyclohexane
Cyclohexane	Methyl tert-butyl ether
1,4-Dioxane	trans-1,2-Dichloroethene
1,2-Dibromoethane	4-Methyl-2-pentanone
Dichlorodifluoromethane	2-Hexanone
cis-1,2-dichloroethene	Trichlorofluoromethane
1,2-Dichloropropane	1,1,2-Trichloro-1,2,2-trifluoroethane

ACTION: If %RSD > 20.0%, (> 40.0% for the poor performers, and > 50% for 1,4-dioxane), qualify associated positive results for that analyte "J" (estimated). If %RSD is > 90, flag all non-detects for that analyte "R" (unusable) and positive results "J".

NOTE: Analytes previously qualified "U" for blank contamination are still treated as "hits" when qualifying for initial calibration criteria.

12.3 Are any $\overline{RRF}$s < 0.050 (< 0.010 for poor performers)? ✓ [ ] ___

ACTION: Circle all outliers in red.

ACTION: If any $\overline{RRF}$ values are < 0.05 or < 0.01 for poor performers, qualify associated non-detects unusable (R) and associated positive results estimated (J).

ACTION: Document in the Data Assessment under Contract Problems/Non-Compliance the analytes that fail %RSD and/or RRF criteria.

12.4 Are there any transcription/calculation errors in the reporting of RRFs, RRFs or %RSD values? (Check at least 2 values, but if errors are found, check more.) ___ [✓] ___

ACTION: Circle errors in red.

YES NO N/A

. . . . . .

ACTION: If errors are large, contact the TOPO to obtain an explanation/resubmittal from the lab, document in the Data Assessment under Contract Problems/Non-Compliance.

13.0 GC/MS Continuing Calibration Verification (CCV) (Form VII)

13.1 Are the Continuing Calibration Forms (Form VII) present and complete for the volatile fraction? [✓] ___ ___

13.2 Did the 12 hour clock begin with either the injection of BFB or in cases where a closing CCV can be used as an opening CCV for each instrument? [✓] ___ ___

ACTION: If any forms are missing or no continuing calibration standard has been analyzed within twelve hours of every sample analysis, ask the TOPO to obtain explanation/resubmittal from the laboratory. If continuing calibration data are unavailable, flag all associated sample data as unusable (R).

13.3 Do any volatile compounds have a % Difference (% D) between the initial RRF and CCV RRF exceeding ± 50% for 1,4-Dioxane, ± 40% for the poor performers or ± 25% for the remaining compounds? ___ [✓] ___

ACTION: Circle all outliers in red.

13.4 Do any volatile compounds have a RRF < 0.05 or < 0.01 for the poor performers? ___ [ ] ___

ACTION: Circle all outliers in red.

Note: Verify that the CCV was run at the required frequency (an opening and closing CCV must be run within 12-hour period) and the CCV was compared to the correct initial calibration. If the mid-point standard from the initial calibration is used as an opening CCV, verify that the result (RRF) of the mid-point standard was compared to the average RRF from the correct initial calibration.

Note: The closing CCV used to bracket the end of a 12-hour analytical sequence may be used as the opening CCV for the new 12-hour analyical sequence, provided that all the technical acceptance criteria are met for an opening CCV (see table below). If the closing CCV does not meet the technical acceptance criteria for an opening CCV, then a BFB tune followed by an opening CCV is required and the next 12-hour time period begins with the BFB tune.

Action: Use the following table to qualify data based on the technical acceptance criteria for the opening CCV and closing CCV.

Continuing Calibration Verification (CCV) Actions for Low/Medium Volatiles Analyses

Criteria for	Criteria for	Action

YES NO N/A

. . . . . .

Opening CCV	Closing CCV	Detected Associated Compounds	Non-Detected Associated Compounds
RRF < 0.010 (poor responders) RRF < 0.050 (all other volatile target compounds)	RRF < 0.010 (for all volatile target compounds)	J	R
RRF ≥ 0.010 (poor responders) RRF ≥ 0.050 (for all other compounds)	RRF ≥ 0.010 (for all target volatile compounds)	No Action	
%D > 50.0 or < -50.0 (1,4-Dioxane) %D > 40.0 or < -40.0 (poor responders) %D > 25.0 or < -25.0 (all other volatile target compounds)	%D > 50.0 or < -50.0 (for all volatile target compounds)	J	UJ
%D ≤ 50.0 or ≥ -50.0 (1,4-Dioxane) %D ≤ 40.0 or ≥ -40.0 (poor responders) %D ≤ 25.0 or ≥ -25.0 (all other volatile target compounds)	%D ≤ 50.0 or ≥ -50.0 (for all volatile target compounds)	No Action	
Opening CCV not performed at required frequency *	Closing CCV not performed at required frequency *	R	

* See section 13.2 above

ACTION: Document in the Data Assessment under Contract Problems/Non-Compliance if more than two of the required analytes failed the above acceptance criteria.

13.5 Are there any transcription/calculation errors for the reporting of RRFs, or %D between initial RRFs and continuing RRFs? (Check at least two values but if errors are found, check more.) ___ ✓1 ___

ACTION: Circle errors with red pencil.

ACTION: If errors are large, notify the TOPO to obtain explanation/resubmittals from the lab. Document errors in the Contract Problems/Non-Compliance section of the Data Assessment.

Note: All DMCs must meet RRF ≥ 0.010. No qualification of the data is necessary on the DMCs RRF and %RSD/%Diff data alone. However, use professional judgment to evaluate the DMC and %RSD/% Diff data in conjunction with the DMC recoveries to determine the need of qualification of the data.

14.0 Internal Standard (Form VIII)

14.1 Were the internal standard area counts for every sample and blank within the range of 50.0% and 200.0% of its response in the most recent opening CCV standard calibration? ✓1 ___ ___

	YES	NO	N/A
. . . . .			
If no, were affected sample reanalyzed?	[ ]	___	✓

ACTION: 1. Circle all outliers with red pencil.

14.2	Are the retention times of the internal standards in sample or blanks within ±30 seconds from the RT of the internal standard in the 12-hour associated calibration standard (opening CCV or mid-point standard from initial calibration)?	[✓]	___	___

Action: Use the following table to qualify the data:

INTERNAL STANDARDS ACTIONS FOR LOW/MEDIUM VOLATILES

Criteria	ACTION	
	Detected Associated Compounds *	Non-detected Associated Compounds *
Area counts ≥ 50% and ≤ 200% of 12-hour standard (opening CCV or mid-point standard from initial calibration)	No Action	
Area counts < 50% of 12-hour standard (opening CCV or mid-point standard from initial calibration)	J	R
Area counts > 200% of 12-hour standard (Opening CCV or mid-point standard from initial calibration)	J	No Action
RT difference > 30.0 seconds between samples and 12-hour standard (Opening CCV or mid-point standard from initial calibration)	R**	R
RT difference ≤ 30.0 seconds between samples and 12-hour standard (Opening CCV or mid-point standard from initial calibration)	No Action	

* For volatile compounds associated to each internal standard, see Table 3-Low/Medium Volatile Target Compounds and Deuterated Monitoring Compounds with Corresponding Internal Standards for Quantitation in SOM01.1, Exhibit D, available at:

Http://www.epa.gov/superfund/programs/clp/som1.htm

** Examine the chromatographic profile for that sample to determine if any false positives or negatives exist. For shifts of a large magnitude, the reviewer may consider partial or total rejection of the data for that sample fraction. Detects should not need to be qualified as unusable "R" if the mass spectral are met.

NOTE: Contract Requirements: The SOM (section 11.4.1 page D-46/VOA Low/Medium states that any sample which fails the acceptance criteria for IS response must be reanalyzed.

ACTION: Document in the Data Assessment under Contract Problems/Non-Compliance any sample(s) which failed the above IS acceptance criteria.

15.0 Field Duplicates

15.1 Were any field duplicates submitted for Low Concentration VOA analysis? [ ] ___ ___

ACTION: Compare the reported results for field duplicates and calculate the relative percent difference.

ACTION: Any gross variation between duplicate results must be addressed in the reviewer narrative. If large differences exist, contact the TOPO to confirm identification of field duplicates with the sampler.

. . . . . .

Definitions

BFB - bromofluorobenzene
CCS - contract compliance screening
CLASS - Contract Laboratory Analytical Services Support
CLP - Contract Laboratory Program
CRQL - Contract Required Quantitation Limit
GC/MS - gas chromatography/mass spectroscopy
kg - kilogram
µg - microgram
ℓ - liter
mℓ - milliliter
QC - quality control
RAS - Routine Analytical Services
RIC - reconstructed ion chromatogram
RPD - relative percent difference
RRF - relative response factor
$\overline{RRF}$ - average relative response factor (from initial calibration)
RRT - relative retention time
RSD - relative standard deviation
RT - retention time
RSCC - Regional Sample Control Center
SDG - sample delivery group
SOP - standard operating procedure
SOW - Statement of Work
TCL - Target Compound List
TCLP - Toxicity Characteristics Leachate Procedure
TIC - tentatively identified compound
TPO - technical project officer
VOA - volatile organic acid
VTSR - validated time of sample receipt
TOPO - Task Order Project Officer

References

1. USEPA Contract Laboratory Program of Work for Organic Analysis Multi-Media, Multi-Concentration, SOW/CLPSOM01.1, October 2004
2. National Functional Guidelines for Superfund Organic Methods Data Review January 2005

Functional Guidelines for Evaluating Organic Analysis

CASE No.: 37351
LABORATORY: COMPUCHEM
SAMPLER: USEPA

SDG No.: B4TM7
SITE: Diamond Head Oil
ANALYSIS: VOA

DATA ASSESSMENT

The current SOP HW-33/VOA (Revision 1) August 2007, USEPA Region II Data Validation SOP for Statement of Work SOM01.2 for evaluating organic data has been applied.

All data are valid and acceptable except those analytes rejected "R"(unusable). Due to the detection of QC problems, some analytes may have the "J" (estimated), "N"(presumptive evidence for the presence of the material), "U" (non-detect) or "JN" (presumptive evidence for the presence of the material at an estimated value) flag. All action is detailed on the attached sheets.

The "R" flag means that the associated value is unusable. In other words, significant data bias is evident and the reported analyte concentration is unreliable.

Reviewer's Signature: Shobitha Amin — Date: May / 21 / 2008

Peer Reviewer's Signature: C. Stamos — Date: 5 / 22 /2008

Verified By: S. Kanas — Date: 5 / 22 /2008

SDG#B4TM7

1. HOLDING TIME:

The amount of an analyte in a sample can change with time due to chemical instability, degradation, volatilization, etc. If the specified holding time is exceeded, the data may not be valid. Those analytes detected in the samples whose holding time has been exceeded will be qualified as estimated, "J". The non-detects (sample quantitation limits) will be flagged as estimated, "J", or unusable, "R", if the holding times are grossly exceeded.

The following action was taken in the samples and analytes shown due to excessive holding time.

No problems found for this qualification.

2. DMC's

All samples are spiked with surrogate compounds (DMC's) prior to sample preparation to evaluate overall laboratory performance and efficiency of the analytical technique. If the measured surrogate concentrations were outside contract specifications, qualifications were applied to the samples and analytes as shown below.

VDSS4-The following volatile samples have one or more DMC/SMC recovery values is less than the primary lower limit but greater than or equal to the expanded lower limit of the criteria window. Detected compounds are qualified J. Nondetected compounds are qualified UJ.

-B4TM7, B4TM8, B4TN0, B4TN1, B4TN2, B4TZ7

- **2-Butanone-d5** B4TM8, B4TN0

-2-Butanone, Acetone

- **1,2-Dichloropropane-d6** B4TM7, B4TM8, B4TN0, B4TN1, B4TN2, B4TZ7

-1,2-Dichloropropane, Bromodichloromethane, Cyclohexane, Methylcyclohexane

3. MATRIX SPIKE/SPIKE DUPLICATE, MS/MSD:

The MS/MSD data are generated to determine the long-term precision and accuracy of the analytical method in various matrices. The MS/MSD may be used in conjunction with other QC criteria for additional qualification of data.

Not Applicable.

4. BLANK CONTAMINATION:

Quality assurance (QA) blanks, i.e., method, trip, field, or rinse blanks are prepared to identify any contamination, which may have been introduced into the samples during sample preparation or field activity. Method blanks measure laboratory contamination. Trip blanks measure cross-contamination of samples during shipment. Field and rinse blanks measure cross-contamination of samples during field operations. If the concentration of the analyte is less than 1 times the blank contaminant level (2

times for common contaminants), the analytes are qualified as non-detects, "U".

The following analytes in the sample shown were qualified with "U" for these reasons:

A) **Method blank contamination:**

The following volatile samples have common contaminant analyte concentrations reported less than 2x the CRQL. The associated method blank common contaminant concentration is less than 2x the concentration criteria Detected compounds are qualified U. Nondetected compounds are not qualified. Reported sample concentrations have been elevated to the CRQL.

- **Methylene chloride** B4TM8, B4TM9, B4TN0, B4TN1

B) **Field or rinse blank contamination:**
No additional qualification due to Field blank contamination.

C) **Trip blank contamination for VOA aqueous samples:**

The following volatile samples have common contaminant analyte concentrations reported less than 2x the CRQL. The associated Trip blank common contaminant concentration is greater than the CRQL. Detected compounds are qualified U. Nondetected compounds are not qualified. Reported sample concentrations have been elevated to the CRQL.

Acetone B4TM8, B4TN2

D) **Storage Blank associated with VOA samples only:**

No problems found for this qualification.

E) **Tics "R" rejected**:
None.

5. MASS SPECTROMETER TUNING:

Tuning and performance criteria are established to ensure adequate mass resolution, proper identification of compounds and to some degree, sufficient instrument sensitivity. These criteria are not sample specific. Instrument performance is determined using standard materials. Therefore, these criteria should be met in all circumstances. The tuning standard for volatile organics is (BFB) Bromofluorobenzene.

If the mass calibration is in error, all associated data will be classified as unusable "R".

No problems found for this qualification.

6. CALIBRATION:

Satisfactory instrument calibration is established to ensure that the instrument is capable of producing acceptable quantitative data. An initial calibration demonstrates that the instrument is capable of giving acceptable performance at the beginning of an experimental sequence. The continuing calibration checks document that the instrument is giving satisfactory daily performance.

A) Response Factor GC/MS:

The response factor measures the instrument's response to specific chemical compounds. The response factor for the Target Compound List (TCL) must be ≥ 0.05, and ≥ 0.01 for the twenty-two analytes with poor response in both the initial and continuing calibrations. A value < 0.05, or < 0.01 for the poor performers indicates a serious detection and quantitation problem (poor sensitivity). Analytes detected in the sample will be qualified as estimated, "J". All non-detects for that compound

will be rejected "R".

VC15-The following volatile samples are associated with an initial/ continuing/ closing calibration with relative response factors (RRFs) outside criteria. Detected compounds are qualified J. Non detected compounds are qualified R.

VC15-The following volatile samples are associated with an initial calibration with relative response factors (RRFs) outside criteria. Detected compounds are qualified J. Nondetected compounds are qualified R.

-B4TM7, B4TM8, B4TM9, B4TN0, B4TN1, B4TN2, B4TN3, B4TZ7, VBLKBK, VBLKBO, VHBLKYI

- **1,4-Dioxane** VSTD005BI, VSTD005BO, VSTD010BI, VSTD010BO, VSTD050BI, VSTD050BO, VSTD100BI, VSTD100BO, VSTD200BI, VSTD200BO

-B4TM7, B4TM8, B4TM9, B4TN0, B4TN1, B4TN2, B4TN3, B4TZ7, VBLKBK, VBLKBO, VHBLKYI

VC20-The following volatile samples are associated with an initial calibration in which a DMC did not meet relative response factor (RRF) criteria. Detected compounds are qualified J. Nondetected compounds are qualified R.

-B4TM7, B4TM8, B4TM9, B4TN0, B4TN1, B4TN2, B4TN3, B4TZ7, VBLKBK, VBLKBO, VHBLKYI

- **1,4-Dioxane-d8** VSTD005BI, VSTD005BO, VSTD010BI, VSTD010BO, VSTD050BI, VSTD050BO, VSTD100BI, VSTD100BO, VSTD200BI, VSTD200BO

-B4TM7, B4TM8, B4TM9, B4TN0, B4TN1, B4TN2, B4TN3, B4TZ7, VBLKBK, VBLKBO, VHBLKYI

-1,4-Dioxane

B) Percent Relative Standard Deviation (%RSD) and Percent Difference (%D):

Percent RSD is calculated from the initial calibration and is used to indicate the stability of the specific compound response factor over increasing concentration. Percent D compares the response factor of the continuing calibration check to the mean response factor (RRF) from the initial calibration. Percent D is a measure of the instrument's daily performance. Percent RSD must be < 20%, < 40% for the poor performers, and < 50% for 1,4-Dioxane. %D must be < 25%, < 40% for the poor performers, and < 50% for 1,4-Dioxane. A value outside of these limits indicates potential detection and quantitation errors. For these reasons, all positive results are flagged as estimated, "J" and non-detects are flagged "UJ". If %RSD and %D grossly exceed QC criteria (> 90%), non-detects data may be qualified "R".

The following analytes in the sample shown were qualified for %RSD and %D:

VC6-The following volatile samples are associated with an initial calibration percent relative standard deviation (%RSD) outside criteria. Detected compounds are qualified J. Nondetected compounds are not qualified.

-VBLKBO, VHBLKYI

- **1,2,4-Trichlorobenzene** VSTD005BO

-VBLKBO, VHBLKYI

8. INTERNAL STANDARDS PERFORMANCE GC/MS:

Internal standards (IS) performance criteria ensure that the GC/MS sensitivity and response are stable during every experimental run. The internal standard area count must not vary by more than a factor of 2 (-50% to +200%) from the associated continuing calibration standard. The retention time of the internal standard must not vary more than 30 seconds from the associated continuing calibration standard. If the area count is outside the (-50% to +200%) range of the associated standard, all of the positive results for compounds quantitated using that IS are qualified as estimated, "J", and all non-detects as "UJ", or "R" if there is a severe loss of sensitivity.

If an internal standard retention time varies by more than 30 seconds, the reviewer will use professional judgment to determine either partial or total rejection of the data for that sample fraction.

No problems found for this qualification.

9. COMPOUND IDENTIFICATION:

A) Volatile Fraction:

TCL compounds are identified on the GC/MS by using the analyte's relative retention time (RRT) and by comparison to the ion spectra obtained from known standards. For the results to be a positive hit, the sample peak must be within 0.06 RRT units of the standard compound and have ion spectra which has a ratio of the primary and secondary m/e intensities within 20% of that in the standard compound. For the tentatively identified compounds (TIC) the ion spectra must match accurately. In the cases where there is not an adequate ion spectrum match, the laboratory may have provided false positive identifications.

No problems found for this qualification.

10. CONTRACT PROBLEMS NON-COMPLIANCE:

1, 4-Dioxane:
Average response factor (RRF) is below the Contractual Criteria in the initial Calibration.
Continuing response factor (RF5.0) is below the contractual criteria in all the opening and closing CCV calibrations.

1, 4-Dioxane-d8:
Average response factor (RRF) is below the Contractual Criteria in the initial Calibration.
Continuing response factor (RF5.0) is below the contractual criteria in all the opening and closing CCV calibrations.

%RSD for 1,2,4-Trichlorobenzene is outside criteria for initial calibration.

11. FIELD DOCUMENTATION:
No problems found for this qualification.

12. OTHER PROBLEMS:

13. **This package contains re-extracted, reanalyzed or dilution runs. Upon reviewing the QA results, the following Form 1(s) are identified NOT to be used.**
None.

CompuChem

a division of Liberty Analytical Corporation
501 Madison Avenue
Cary, N.C. 27513
Tel: 919/379-4100 Fax: 919/379-4050

RECEIVED
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HAZ. WASTE SUPPORT SEC

SDG NARRATIVE
CASE # 37351
SDG # B4TM7
SOW: SOM01.2
CONTRACT # EPW05028

SAMPLE IDENTIFICATIONS: B4TM7, B4TM8, B4TM9, B4TN0, B4TN1, B4TN2, B4TN3 and B4TZ7

The 8 aqueous samples listed above were received intact, properly refrigerated at 2.7°C, in sealed shipping containers, on April 10, 2008. Proper documentation was received except for the information that is provided in the traffic reports. Sample tags were not received with the samples.

All samples in this SDG were scheduled for the requested analysis of the volatile fraction. The samples were prepared and analyzed following the current EPA Contract Laboratory Program (CLP) Low Concentration Statement of Work (SOW), Document SOM01.2 Low/Medium analysis. All pertinent Quality Assurance Notices are included in the narrative section. This narrative pertains to the volatile fraction only.

Low/Medium Volatiles

Analysis holding time requirements were met for the samples.

The pH values for the samples in this SDG were equal to 1.

There were volatile Project/Target Compound List (TCL) analytes identified above the Contract Required Quantitation Limit (CRQL) in 6 of the samples.

Tentatively Identified Compounds (TICs) found in 5 of the samples and Total alkanes were found in 4 of the samples.

All of the deuterated monitoring compounds (DMCs) met recovery criteria in the analyses of these samples. All of the internal standards met response and retention time criteria in the analyses of these samples.

In a response to a Statement of Work Interpretation, the Organic Contract Laboratory Program Office stated that if the mass spectral interpretation specialist determines a TIC to be a laboratory artifact (including artifacts from the DMC solution), there is no need to report it. However, all TICs not reported due to a mass spectral interpretation specialist's assessment should be noted in the SDG Narrative. There are laboratory artifacts (including artifacts from the DMC solution) not reported on the Forms 1J. Their approximate retention times are as follows:
11.462 min. Laboratory artifact
The peak is present in the standards, blanks, and samples.

Manual quantitations were performed on the process files associated with this SDG, including all initial and continuing calibration standards. The reasons have been coded with explanations provided in the notice included in the narrative section of the SDG. All Bromofluorobenzene (BFB) abundance criteria were met for tunes associated to this SDG. Overall QC criteria were met for all initial and continuing calibration standards associated to this SDG.

The associated method blanks and the storage blank met all quality control criteria.

As per the SOW, an example calculation is attached for Vinyl Chloride-d_3 in sample B4TM7.

No matrix spike/matrix spike duplicate (MS/MSD) samples were requested for the volatile fraction with this SDG.

I certify that this Sample Data Package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy Sample Data Package and in the electronic data deliverable has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signature.

2

Kenneth Grzybowski
GC/GCMS Volatile Supervisor
April 21, 2008

CASE: 37351
SDG: B4TM7

Example Calculation for the Volatile Fraction

RRF Calculation

RRF=(Ax*Cis)/(Ais*Cx)

Where: Ax=Area of the characteristic ion (EICP) for the compound to be measured
Ais=Area of the characteristic ion (EICP) for the specific internal standard
Cis=Concentration of the internal standard
Cx=Concentration of the compound to be measured

Example: Vinyl chloride-d3 from 8D15001-CCV2

Ax=	225829
Ais=	465668
Cis=	250
Cx=	250
RRF=	0.485

Mean RRF from ICAL 0.508

Concentration Calculation

Concentration(ug/L)=(Ax*Is*Df)/(Ais*RRF*Vo)

Where: Ax=Area of the characteristic ion (EICP) for the compound to be measured
Ais=Area of the characteristic ion (EICP) for the specific internal standard
Is=Amount of the internal standard added, in nanograms
Mean RRF=Relative response factor from the Initial calibration standard
Vo=Total volume of water purged, in milliliters
Df=Dilution factor

Example: Vinyl chloride-d_3 from B4TM7

Ax=	204376
Ais=	394247
Is=	250
Mean RRF=	0.508
Vo=	5
Df=	1

Concentration(ug/L)= 51

GC and GC/MS Column and Trap Specifications Table

SDG #:	BHTM7

COLUMNS

Columns Utilized	Brand Name	Coating Material	ID (mm)	Film Thickness (um)	Length (m)
	GC Laboratory				
	Restek	RTX-5	0.53	1.0	30
	Restek	RTX-SMS	0.53	1.0	30
	Restek	clpest	0.32	0.5	30
	Restek	clpest2	0.32	0.42	30
	J&W	DB-210	0.53	1.0	30
	J&W	GS-GASPRO	0.32	N/A	30
	GC Volatiles Laboratory				
	Restek	RTX-Volatiles	0.53	2.0	30
	GC/MS Volatiles Laboratory				
	Restek	RTX-VMS	0.18	1.0	20
X	Supelco	SPB-624	0.32	1.8	60
	Supelco	SPB-624	0.53	3.0	75
	Phenomonex	ZB-624	0.32	1.8	60
	GC/MS Semivolatiles Laboratory				
	Restek	RTX-5MS	0.32	0.25	30
	Phenomonex	ZB-5MS	0.32	0.25	30
	HPLC Laboratory				
	Supelco	Supelcosil LC-PAH	4.6	5.0	15 cm
	Supelco	Discovery RP Amide C16	4.6	5.0	25 cm
	Restek	Pinnacle Cyano	4.6	5.0	25 cm
	Restek	Allure C18	4.6	5.0	25 cm

TRAPS

	GC and GC/MS Volatiles Laboratory	
	Supelco J (BETXTRAP™)	* 7.7 cm Carbopack C
		* 1.2 cm Carbopack B
X	Supelco K (Vocarb3000)	* 10 cm of Carbopack B (Graphitized Carbons)
		* 6 cm of Carboxen 1000 (Carbon molecular sieves)
		* 1 cm of Carboxen 1001 (Carbon molecular sieves)

Rev. 22

CompuChem's Pagination Convention

As required by the EPA CLP Statement of Work (SOW) documents, data to be delivered must be paginated (by machine or hand). In the event that the initial numbering is incorrect (a page numbered twice or a page skipped, for example), it is CompuChem's policy to add an alphabetic suffix to a page number when necessary (e.g., 100A, 100B, etc.).

Notification Regarding Manual Editing/Integration Flags

In some instances, manual adjustments to the software output are necessary to provide accurate data. These manual integrations are performed by the data reviewers, GC/MS operators, or GC chemists. An Extracted Ion Current Profile (EICP) or a GC chromatographic peak has been provided for the manual integration performed on each compound to demonstrate the accuracy of that process. The manual integrations are flagged on the quantitation report in the far right column beyond the FINAL concentration for GC/MS analysis, and in the "Flags" column for GC analysis. The manual editing/integration flags are:

M - Denotes that a manual integration has been performed for this compound. The manual integration was performed in order to provide the most accurate area count possible for the peak.

H - Denotes that the data reviewer, GC/MS operator, or GC Chemist has chosen an alternate peak within the retention time window from that chosen by the software for that compound. No manual integration is performed in choosing an alternate peak. The software still performs the integration.

MH - Denotes that an alternate peak has been chosen within the retention time window from that chosen by the software for that compound and also a manual integration of the chosen peak has been performed. The manual integration was performed in order to provide the most accurate area count possible for the peak.

L - Denotes that a data reviewer or GC/MS operator has selected an alternate library search. This is typically done when an additional tentatively identified compound (TIC) has been added to the number of peaks searched. No manual integration is performed in choosing an alternate peak. The software still performs the integration.

ML - Denotes that an alternate library search has been selected and a manual integration has also been performed. This is typically done when an additional TIC has been added and the TIC peak also required a manual integration.

The EPA CLP SOW documents require additional explanations for manual editing/integration. In the accompanying raw data packages, additional codes have been applied to the "M" flag and carry the following meanings;

M1 - The compound was not found by the automatic integration routine.

M2 - The compound was incorrectly integrated by the automatic integration routine.

M3 - The co-eluting compounds were incorrectly integrated by the automatic integration routine.

These codes will appear in the GC/MS and GC raw data.

DATA REPORTING QUALIFIERS

On the Form I, under the column labeled "Q" for qualifier, each result is flagged with the specific data reporting qualifiers listed below, as appropriate. Up to five qualifiers may be reported on Form I for each compound. The qualifiers used are:

U : This flag indicates the compound was analyzed for but not detected. The Contract Required Quantitation Limit (CRQL), or reporting limit, will be adjusted to reflect any dilution and, for soils, the percent moisture.

J : This flag indicates an estimated value. The flag is used as detailed below:

1. When estimating a concentration for tentatively identified compounds (TICs) where a response factor of 1:1 is assumed for the TIC analyte,

2. When the mass spectral and retention time data indicate the presence of a compound that meets the volatile and semivolatile GC/MS identification criteria, and the result is less than the adjusted CRQL (or Reporting Limit) but greater than zero, and

3. When the retention time data indicate the presence of a compound that meets the pesticide and/or Aroclor or other GC or HPLC identification criteria, and the result is less than the adjusted CRQL (or Reporting Limit) but greater than zero. For example, if the CRQL (or Reporting Limit) is 10 µg/L, but a concentration of 3 µg/L is calculated, it is reported as 3J.

N : This flag indicates presumptive evidence of a compound. This flag is only used for TICs, where the identification is based on a mass spectral library search and must be used with the J flag. For generic characterization of a TIC such as "chlorinated hydrocarbon" (or for an "unknown," with no matches ≥ 85% in the SOM01.2 SOW document), the N flag is not used.

P : In the EPA's Contract Laboratory Program (CLP), this flag is used for a pesticide/Aroclor target analyte, when there is greater than 25% difference for detected concentrations between the two GC columns. The lower of the two values is reported on the Form I and flagged with a P.
For SW-846 GC and HPLC analyses, when the Relative Percent Difference (RPD) is greater than 40% and there is no evidence of chromatographic anomalies or interferences, then the higher of the two values is reported and flagged with a P. When the RPD is equal to or less than 40%, our policy is to also report the higher of the two values, although the choice could be a project specific issue. For certain HPLC analyses, if one of the HPLC columns displays co-elution of target analytes, all results are reported from a primary column displaying no co-elution. Results are still flagged with a P if the RPD between columns is greater than 40%.

C : This flag applies to GC or HPLC results where the identification has been confirmed by GC/MS. If GC/MS confirmation was attempted but was unsuccessful, this flag is not applied; a laboratory-defined flag is used instead (see the X/Y/Z qualifier.)

DATA REPORTING QUALIFIERS (continued)

B : This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates probable blank contamination and warns the data user to take appropriate action. This flag is used for a TIC as well as for a positively identified target compound. The combination of flags BU or UB is not an allowable policy. Blank contaminants are flagged B only when they are detected in the sample.

E : This flag identifies compounds whose concentrations exceed the upper level of the calibration range of the instrument for that specific analysis. If one or more compounds have a concentration greater than the upper level of the calibration range, the sample or extract will be diluted and reanalyzed. All such compounds with a concentration greater than the upper level of the calibration range will have the result flagged with an E on Form I for the original analysis.

D : If a sample or extract is reanalyzed at a higher dilution factor, for example when the concentration of an analyte exceeds the upper calibration range, the DL suffix is appended to the sample number on the Form I for the more diluted sample, and all reported concentrations on that Form I are flagged with the D flag. This flag alerts data users that any discrepancies between the reported concentrations may be due to dilution of the sample or extract.

NOTE 1: The D flag is not applied to compounds which are not detected in the sample analysis i.e. compounds reported with the CRQL (or Reporting Limit) and the U flag.

NOTE 2: Separate Forms I are used for reporting the original analysis (Client Sample No. XXXXX) and the more diluted sample analysis (Client Sample No: XXXXXDL) i.e. the results from both analyses are not combined on a single Form I.

A: This flag indicates that a TIC is a suspected aldol-condensation product.

S: In the SOM01.2 SOW document, this flag is used to indicate an estimated value for Aroclor target compounds where a valid 5-point initial calibration was not performed prior to the analytes detection in a sample. If an "S" flag is used for a specific Aroclor, then a reanalysis of the sample is required after a valid 5-point calibration is performed for the detected Aroclor.

X/Y/Z : Other specific flags may be required to properly define the results. If used, the flags will be fully described in the SDG Narrative. The laboratory-defined flags are limited to X, Y, and Z.

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ORIGINAL

Sample Delivery Group (SDG) Cover Sheet

SDG Number B4TM7

Laboratory Name CompuChem

VOA ONLY
Laboratory Code LIBRTY

Contract No. EPW05028

Case No. 37351

Analysis Price NA

SDG Turnaround 21

EPA Sample Numbers in SDG (Listed in Numerical Order)

1)	B4TM7	7)	B4TN3	13)		19)	
2)	B4TM8	8)	B4TZ7	14)		20)	
3)	B4TM9	9)		15)		21)	
4)	B4TN0	10)		16)		22)	
5)	B4TN1	11)		17)		23)	
6)	B4TN2	12)		18)		24)	

B4TM7
First Sample in SDG

B4TZ7
Last Sample in SDG

4/10/2008
First Sample Receipt Date

4/10/2008
Last Sample Receipt Date

Note: There are a maximum of 20 **field** samples (excluding PE samples in an SDG. Attach TRs to this form in alphanumeric order (the order listed above on this form).

Signature Joan Purdee

Date 04/10/08

11

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
B4TM7 FB

Lab Name: COMPUCHEM Contract: EPW05028

Lab Code: LIBRTY Case No.: 37351 Mod. Ref No.: SDG No.: B4TM7

Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: 0804014-01

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: 0804014-0191.d

Level: (TRACE/LOW/MED) LOW Date Received: 04/10/2008

% Moisture: not dec. Date Analyzed: 04/16/2008

GC Column: SPB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 5.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
75-71-8	Dichlorodifluoromethane	5.0	U
74-87-3	Chloromethane	5.0	U
75-01-4	Vinyl chloride	5.0	U
74-83-9	Bromomethane	5.0	U
75-00-3	Chloroethane	5.0	U
75-69-4	Trichlorofluoromethane	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U
67-64-1	Acetone	15	
75-15-0	Carbon disulfide	5.0	U
79-20-9	Methyl acetate	5.0	U
75-09-2	Methylene chloride	0.61	JB
156-60-5	trans-1,2-Dichloroethene	5.0	U
1634-04-4	Methyl tert-butyl ether	5.0	U
75-34-3	1,1-Dichloroethane	5.0	U
156-59-2	cis-1,2-Dichloroethene	5.0	U
78-93-3	2-Butanone	10	U
74-97-5	Bromochloromethane	5.0	U
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
110-82-7	Cyclohexane	5.0	U
56-23-5	Carbon tetrachloride	5.0	U J
71-43-2	Benzene	5.0	U
107-06-2	1,2-Dichloroethane	5.0	U
123-91-1	1,4-Dioxane	100	U R

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
B4TM7

Lab Name: COMPUCHEM Contract: EPW05028

Lab Code: LIBRTY Case No.: 37351 Mod. Ref No.: _____ SDG No.: B4TM7

Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: 0804014-01

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: 0804014-0191.d

Level: (TRACE/LOW/MED) LOW Date Received: 04/10/2008

% Moisture: not dec. _____ Date Analyzed: 04/16/2008

GC Column: SPB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Purge Volume: 5.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
79-01-6	Trichloroethene	5.0	U
108-87-2	Methylcyclohexane	5.0	U J
78-87-5	1,2-Dichloropropane	5.0	U J
75-27-4	Bromodichloromethane	5.0	U J
10061-01-5	cis-1,3-Dichloropropene	5.0	U
108-10-1	4-Methyl-2-pentanone	10	U
108-88-3	Toluene	5.0	U
10061-02-6	trans-1,3-Dichloropropene	5.0	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	5.0	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	5.0	U
106-93-4	1,2-Dibromoethane	5.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	5.0	U
95-47-6	o-Xylene	5.0	U
179601-23-1	m,p-Xylene	5.0	U
100-42-5	Styrene	5.0	U
75-25-2	Bromoform	5.0	U
98-82-8	Isopropylbenzene	5.0	U
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U
541-73-1	1,3-Dichlorobenzene	5.0	U
106-46-7	1,4-Dichlorobenzene	5.0	U
95-50-1	1,2-Dichlorobenzene	5.0	U
96-12-8	1,2-Dibromo-3-chloropropane	5.0	U
120-82-1	1,2,4-Trichlorobenzene	5.0	U
87-61-6	1,2,3-Trichlorobenzene	5.0	U

1J - FORM I VOA-TIC
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.: B4TM7

Lab Name: COMPUCHEM
Contract: EPW05028
Lab Code: LIBRTY Case No.: 37351 Mod. Ref No.: SDG No.: B4TM7
Matrix: (SOIL/SED/WATER) WATER
Lab Sample ID: 0804014-01
Sample wt/vol: 5.00 (g/mL) mL
Lab File ID: 0804014-0191.d
Level: (TRACE or LOW/MED) LOW
Date Received: 04/10/2008
% Moisture: not dec.
Date Analyzed: 04/16/2008
GC Column: SPB-624 ID: 0.32 (mm)
Dilution Factor: 1.0
Soil Extract Volume: (uL)
Soil Aliquot Volume: (uL)
CONCENTRATION UNITS: (ug/L or ug/kg) ug/L
Purge Volume: 5.0 (mL)

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
01					
02					
03					
04					
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
	E966796[1]	Total Alkanes	N/A		

[1]EPA-designated Registry Number.

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
B4TM8

Lab Name: COMPUCHEM Contract: EPW05028

Lab Code: LIBRTY Case No.: 37351 Mod. Ref No.: _____ SDG No.: B4TM7

Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: 0804014-02

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: 0804014-0291.d

Level: (TRACE/LOW/MED) LOW Date Received: 04/10/2008

% Moisture: not dec. _____ Date Analyzed: 04/16/2008

GC Column: SPB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Purge Volume: 5.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
75-71-8	Dichlorodifluoromethane	5.0	U
74-87-3	Chloromethane	5.0	U
75-01-4	Vinyl chloride	5.0	U
74-83-9	Bromomethane	5.0	U
75-00-3	Chloroethane	5.0	U
75-69-4	Trichlorofluoromethane	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U
67-64-1	Acetone	5.0	U
75-15-0	Carbon disulfide	10 ~~6.6~~	~~J~~ UJ
79-20-9	Methyl acetate	5.0	U
75-09-2	Methylene chloride	5.0	U
156-60-5	trans-1,2-Dichloroethene	5.0 ~~0.43~~	~~JB~~ U
1634-04-4	Methyl tert-butyl ether	5.0	U
75-34-3	1,1-Dichloroethane	5.0	U
156-59-2	cis-1,2-Dichloroethene	5.0	U
78-93-3	2-Butanone	1.7	J
74-97-5	Bromochloromethane	10	U J
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
110-82-7	Cyclohexane	5.0	U
56-23-5	Carbon tetrachloride	5.0	U J
71-43-2	Benzene	5.0	U
107-06-2	1,2-Dichloroethane	5.0	U
123-91-1	1,4-Dioxane	5.0	U
		100	~~U~~ R

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
B4TM8

Lab Name: COMPUCHEM Contract: EPW05028

Lab Code: LIBRTY Case No.: 37351 Mod. Ref No.: SDG No.: B4TM7

Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: 0804014-02

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: 0804014-0291.d

Level: (TRACE/LOW/MED) LOW Date Received: 04/10/2008

% Moisture: not dec. Date Analyzed: 04/16/2008

GC Column: SPB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 5.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
79-01-6	Trichloroethene	5.0	U
108-87-2	Methylcyclohexane	5.0	U J
78-87-5	1,2-Dichloropropane	5.0	U J
75-27-4	Bromodichloromethane	5.0	U J
10061-01-5	cis-1,3-Dichloropropene	5.0	U
108-10-1	4-Methyl-2-pentanone	10	U
108-88-3	Toluene	5.0	U
10061-02-6	trans-1,3-Dichloropropene	5.0	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	5.0	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	5.0	U
106-93-4	1,2-Dibromoethane	5.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	5.0	U
95-47-6	o-Xylene	5.0	U
179601-23-1	m,p-Xylene	5.0	U
100-42-5	Styrene	5.0	U
75-25-2	Bromoform	5.0	U
98-82-8	Isopropylbenzene	5.0	U
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U
541-73-1	1,3-Dichlorobenzene	5.0	U
106-46-7	1,4-Dichlorobenzene	5.0	U
95-50-1	1,2-Dichlorobenzene	5.0	U
96-12-8	1,2-Dibromo-3-chloropropane	5.0	U
120-82-1	1,2,4-Trichlorobenzene	5.0	U
87-61-6	1,2,3-Trichlorobenzene	5.0	U

1J - FORM I VOA-TIC

VOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.: B4TM8

Lab Name: COMPUCHEM Contract: EPW05028

Lab Code: LIBRTY Case No.: 37351 Mod. Ref No.: SDG No.: B4TM7

Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: 0804014-02

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: 0804014-0291.d

Level: (TRACE or LOW/MED) LOW Date Received: 04/10/2008

% Moisture: not dec. Date Analyzed: 04/16/2008

GC Column: SPB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS: (ug/L or ug/kg) ug/L Purge Volume: 5.0 (mL)

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
01					
02					
03					
04					
05					
06					
07					
08					
09					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
	E966796[1]	Total Alkanes	N/A		

[1]EPA-designated Registry Number.

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
B4TM9

Lab Name: COMPUCHEM Contract: EPW05028

Lab Code: LIBRTY Case No.: 37351 Mod. Ref No.: SDG No.: B4TM7

Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: 0804014-03

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: 0804014-0391.d

Level: (TRACE/LOW/MED) LOW Date Received: 04/10/2008

% Moisture: not dec. Date Analyzed: 04/16/2008

GC Column: SPB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 5.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
75-71-8	Dichlorodifluoromethane	5.0	U
74-87-3	Chloromethane	5.0	U
75-01-4	Vinyl chloride	5.0	U
74-83-9	Bromomethane	5.0	U
75-00-3	Chloroethane	5.0	U
75-69-4	Trichlorofluoromethane	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U
67-64-1	Acetone	5.0	U
75-15-0	Carbon disulfide	75	
79-20-9	Methyl acetate	5.0	U
75-09-2	Methylene chloride	5.0	U
156-60-5	trans-1,2-Dichloroethene	5.0 ~~1.0~~	~~JB~~ U
1634-04-4	Methyl tert-butyl ether	5.0	U
75-34-3	1,1-Dichloroethane	5.0	U
156-59-2	cis-1,2-Dichloroethene	2.0	J
78-93-3	2-Butanone	72	
74-97-5	Bromochloromethane	13	
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
110-82-7	Cyclohexane	5.0	U
56-23-5	Carbon tetrachloride	3.0	J
71-43-2	Benzene	5.0	U
107-06-2	1,2-Dichloroethane	12	
123-91-1	1,4-Dioxane	5.0	U
Report 1,4-Dioxane for Low-Medium VOA analysis only		100	~~U~~ JK

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
B4TM9

Lab Name: COMPUCHEM Contract: EPW05028

Lab Code: LIBRTY Case No.: 37351 Mod. Ref No.: SDG No.: B4TM7

Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: 0804014-03

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: 0804014-0391.d

Level: (TRACE/LOW/MED) LOW Date Received: 04/10/2008

% Moisture: not dec. Date Analyzed: 04/16/2008

GC Column: SPB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 5.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
79-01-6	Trichloroethene	4.0	J
108-87-2	Methylcyclohexane	6.3	
78-87-5	1,2-Dichloropropane	5.0	U
75-27-4	Bromodichloromethane	5.0	U
10061-01-5	cis-1,3-Dichloropropene	5.0	U
108-10-1	4-Methyl-2-pentanone	9.5	J
108-88-3	Toluene	54	
10061-02-6	trans-1,3-Dichloropropene	5.0	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	12	
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	5.0	U
106-93-4	1,2-Dibromoethane	5.0	U
108-90-7	Chlorobenzene	7.6	
100-41-4	Ethylbenzene	22	
95-47-6	o-Xylene	58	
179601-23-1	m,p-Xylene	84	
100-42-5	Styrene	5.0	U
75-25-2	Bromoform	5.0	U
98-82-8	Isopropylbenzene	2.6	J
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U
541-73-1	1,3-Dichlorobenzene	5.0	U
106-46-7	1,4-Dichlorobenzene	5.0	U
95-50-1	1,2-Dichlorobenzene	5.0	U
96-12-8	1,2-Dibromo-3-chloropropane	5.0	U
120-82-1	1,2,4-Trichlorobenzene	5.0	U
87-61-6	1,2,3-Trichlorobenzene	5.0	U

1J - FORM I VOA-TIC
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
B4TM9

Lab Name: COMPUCHEM Contract: EPW05028

Lab Code: LIBRTY Case No.: 37351 Mod. Ref No.: SDG No.: B4TM7

Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: 0804014-03

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: 0804014-0391.d

Level: (TRACE or LOW/MED) LOW Date Received: 04/10/2008

% Moisture: not dec. Date Analyzed: 04/16/2008

GC Column: SPB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS: (ug/L or ug/kg) ug/L Purge Volume: 5.0 (mL)

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
01		UNKNOWN	10.38	6.2	J
02		UNKNOWN	11.30	7.2	J
03		UNKNOWN	12.31	5.3	J
04	611-14-3	Benzene, 1-ethyl-2-methyl- $$ Tolue	13.69	41	JN
05	95-63-6	Benzene, 1,2,4-trimethyl-	13.74	40	JN
06	62108-25-2	Decane, 2,6,7-trimethyl-	13.83	20	JN
07		UNKNOWN	13.93	22	J
08	526-73-8	Benzene, 1,2,3-trimethyl- $$ Hemime	14.04	71	JN
09		UNKNOWN	14.19	44	J
10	99-87-6	Benzene, 1-methyl-4-(1-methylethyl)	14.88	24	JN
11	768-49-0	Benzene, (2-methyl-1-propenyl)- $$	15.00	25	JN
12		UNKNOWN	15.07	33	J
13		UNKNOWN	15.17	24	J
14	934-74-7	Benzene, 1-ethyl-3,5-dimethyl-	15.25	24	JN
15	934-80-5	Benzene, 4-ethyl-1,2-dimethyl-	15.31	40	JN
16	874-35-1	1H-Indene, 2,3-dihydro-5-methyl- $$	15.64	68	JN
17	527-84-4	Benzene, 1-methyl-2-(1-methylethyl)	15.77	21	JN
18		UNKNOWN	15.97	13	J
19	53172-84-2	Benzene, (1-methyl-1-butenyl)-	16.11	52	JN
20		UNKNOWN	16.19	41	J
21	17059-48-2	1H-Indene, 2,3-dihydro-1,6-dimethyl	16.31	42	JN
22	91-20-3	Naphthalene $$ Albocarbon $$ Dezodo	16.66	85	JN
23		UNKNOWN	16.97	36	J
24	6682-71-9	1H-Indene, 2,3-dihydro-4,7-dimethyl	17.25	37	JN
25		UNKNOWN	17.57	19	J
26	91-57-6	Naphthalene, 2-methyl- $$ .beta.-Me	18.23	26	JN
27	264-09-5	Benzocycloheptatriene	18.59	11	JN
28					
29					
30					
	E966796[1]	Total Alkanes	N/A	380	

[1]EPA-designated Registry Number.

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
B4TN0

Lab Name: COMPUCHEM Contract: EPW05028

Lab Code: LIBRTY Case No.: 37351 Mod. Ref No.: SDG No.: B4TM7

Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: 0804014-04

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: 0804014-0491.d

Level: (TRACE/LOW/MED) LOW Date Received: 04/10/2008

% Moisture: not dec. Date Analyzed: 04/16/2008

GC Column: SPB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 5.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
75-71-8	Dichlorodifluoromethane	5.0	U
74-87-3	Chloromethane	5.0	U
75-01-4	Vinyl chloride	5.0	U
74-83-9	Bromomethane	5.0	U
75-00-3	Chloroethane	5.0	U
75-69-4	Trichlorofluoromethane	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U
67-64-1	Acetone	5.0	U
75-15-0	Carbon disulfide	47	J
79-20-9	Methyl acetate	5.0	U
75-09-2	Methylene chloride	5.0	U
156-60-5	trans-1,2-Dichloroethene	5.0 0.75	~~JB~~ U
1634-04-4	Methyl tert-butyl ether	5.0	U
75-34-3	1,1-Dichloroethane	5.0	U
156-59-2	cis-1,2-Dichloroethene	1.1	J
78-93-3	2-Butanone	36	
74-97-5	Bromochloromethane	8.9	~~J~~ J
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
110-82-7	Cyclohexane	5.0	U
56-23-5	Carbon tetrachloride	5.0	U J
71-43-2	Benzene	5.0	U
107-06-2	1,2-Dichloroethane	3.9	J
123-91-1	1,4-Dioxane	5.0	U
Report 1,4-Dioxane for Low-Medium VOA analysis only		100	~~U~~ R

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
B4TN0

Lab Name: COMPUCHEM Contract: EPW05028

Lab Code: LIBRTY Case No.: 37351 Mod. Ref No.: SDG No.: B4TM7

Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: 0804014-04

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: 0804014-0491.d

Level: (TRACE/LOW/MED) LOW Date Received: 04/10/2008

% Moisture: not dec. Date Analyzed: 04/16/2008

GC Column: SPB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 5.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
79-01-6	Trichloroethene	2.2	J
108-87-2	Methylcyclohexane	5.0	U J
78-87-5	1,2-Dichloropropane	5.0	U J
75-27-4	Bromodichloromethane	5.0	U J
10061-01-5	cis-1,3-Dichloropropene	5.0	U
108-10-1	4-Methyl-2-pentanone	3.2	J
108-88-3	Toluene	12	
10061-02-6	trans-1,3-Dichloropropene	5.0	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	13	
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	5.0	U
106-93-4	1,2-Dibromoethane	5.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	5.0	U
95-47-6	o-Xylene	15	
179601-23-1	m,p-Xylene	19	
100-42-5	Styrene	5.0	U
75-25-2	Bromoform	5.0	U
98-82-8	Isopropylbenzene	0.35	J
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U
541-73-1	1,3-Dichlorobenzene	5.0	U
106-46-7	1,4-Dichlorobenzene	5.0	U
95-50-1	1,2-Dichlorobenzene	5.0	U
96-12-8	1,2-Dibromo-3-chloropropane	5.0	U
120-82-1	1,2,4-Trichlorobenzene	5.0	U
87-61-6	1,2,3-Trichlorobenzene	5.0	U

1J - FORM I VOA-TIC
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.: B4TN0

Lab Name: COMPUCHEM Contract: EPW05028

Lab Code: LIBRTY Case No.: 37351 Mod. Ref No.: SDG No.: B4TM7

Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: 0804014-04

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: 0804014-0491.d

Level: (TRACE or LOW/MED) LOW Date Received: 04/10/2008

% Moisture: not dec. Date Analyzed: 04/16/2008

GC Column: SPB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS: (ug/L or ug/kg) ug/L Purge Volume: 5.0 (mL)

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
01	620-14-4	Benzene, 1-ethyl-3-methyl-	13.69	6.8	JN
02	95-63-6	Benzene, 1,2,4-trimethyl-	13.74	8.5	JN
03	526-73-8	Benzene, 1,2,3-trimethyl- $$ Hemime	14.05	18	JN
04	934-80-5	Benzene, 4-ethyl-1,2-dimethyl-	14.88	6.3	JN
05		UNKNOWN	15.07	6.6	J
06	874-41-9	Benzene, 1-ethyl-2,4-dimethyl-	15.31	5.9	JN
07	824-90-8	1-Phenyl-1-butene	15.83	6.8	JN
08		UNKNOWN	16.11	5.3	J
09		UNKNOWN	16.31	7.1	J
10	91-20-3	Naphthalene	16.66	15	JN
11		UNKNOWN	16.97	8.1	J
12		UNKNOWN	18.59	5.8	J
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
	E966796[1]	Total Alkanes	N/A	15	

[1]EPA-designated Registry Number.

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
B4TN1

Lab Name: COMPUCHEM
Contract: EPW05028
Lab Code: LIBRTY Case No.: 37351 Mod. Ref No.: SDG No.: B4TM7
Matrix: (SOIL/SED/WATER) WATER
Lab Sample ID: 0804014-05
Sample wt/vol: 5.00 (g/mL) mL
Lab File ID: 0804014-0591.d
Level: (TRACE/LOW/MED) LOW
Date Received: 04/10/2008
% Moisture: not dec.
Date Analyzed: 04/16/2008
GC Column: SPB-624 ID: 0.32 (mm)
Dilution Factor: 1.0
Soil Extract Volume: (uL)
Soil Aliquot Volume: (uL)
Purge Volume: 5.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
75-71-8	Dichlorodifluoromethane	5.0	U
74-87-3	Chloromethane	5.0	U
75-01-4	Vinyl chloride	5.0	U
74-83-9	Bromomethane	5.0	U
75-00-3	Chloroethane	5.0	U
75-69-4	Trichlorofluoromethane	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U
67-64-1	Acetone	130	
75-15-0	Carbon disulfide	5.0	U
79-20-9	Methyl acetate	5.0	U
75-09-2	Methylene chloride	5.0 ~~1.0~~	~~JB~~ U
156-60-5	trans-1,2-Dichloroethene	0.48	J
1634-04-4	Methyl tert-butyl ether	5.0	U
75-34-3	1,1-Dichloroethane	1.7	J
156-59-2	cis-1,2-Dichloroethene	64	
78-93-3	2-Butanone	20	
74-97-5	Bromochloromethane	5.0	U
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
110-82-7	Cyclohexane	0.86	~~J~~ J
56-23-5	Carbon tetrachloride	5.0	U
71-43-2	Benzene	11	
107-06-2	1,2-Dichloroethane	5.0	U
123-91-1	1,4-Dioxane	24	~~J~~ J

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
B4TN1

Lab Name: COMPUCHEM Contract: EPW05028

Lab Code: LIBRTY Case No.: 37351 Mod. Ref No.: SDG No.: B4TM7

Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: 0804014-05

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: 0804014-0591.d

Level: (TRACE/LOW/MED) LOW Date Received: 04/10/2008

% Moisture: not dec. Date Analyzed: 04/16/2008

GC Column: SPB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 5.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
79-01-6	Trichloroethene	3.7	J
108-87-2	Methylcyclohexane	5.0	U J
78-87-5	1,2-Dichloropropane	5.0	U J
75-27-4	Bromodichloromethane	5.0	U J
10061-01-5	cis-1,3-Dichloropropene	5.0	U
108-10-1	4-Methyl-2-pentanone	12	
108-88-3	Toluene	52	
10061-02-6	trans-1,3-Dichloropropene	5.0	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	13	
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	5.0	U
106-93-4	1,2-Dibromoethane	5.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	16	
95-47-6	o-Xylene	47	
179601-23-1	m,p-Xylene	63	
100-42-5	Styrene	5.0	U
75-25-2	Bromoform	5.0	U
98-82-8	Isopropylbenzene	1.6	J
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U
541-73-1	1,3-Dichlorobenzene	5.0	U
106-46-7	1,4-Dichlorobenzene	5.0	U
95-50-1	1,2-Dichlorobenzene	5.0	U
96-12-8	1,2-Dibromo-3-chloropropane	5.0	U
120-82-1	1,2,4-Trichlorobenzene	5.0	U
87-61-6	1,2,3-Trichlorobenzene	5.0	U

1J - FORM I VOA-TIC
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
B4TN1

Lab Name: COMPUCHEM Contract: EPW05028

Lab Code: LIBRTY Case No.: 37351 Mod. Ref No.: SDG No.: B4TM7

Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: 0804014-05

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: 0804014-0591.d

Level: (TRACE or LOW/MED) LOW Date Received: 04/10/2008

% Moisture: not dec. Date Analyzed: 04/16/2008

GC Column: SPB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS: (ug/L or ug/kg) ug/L Purge Volume: 5.0 (mL)

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
01		UNKNOWN	13.29	10	J
02	620-14-4	Benzene, 1-ethyl-3-methyl- $$ Tolue	13.69	27	JN
03	95-63-6	Benzene, 1,2,4-trimethyl-	13.74	23	JN
04	611-14-3	Benzene, 1-ethyl-2-methyl-	13.93	13	JN
05	108-67-8	Benzene, 1,3,5-trimethyl-	14.05	47	JN
06		UNKNOWN	14.20	12	J
07	934-80-5	Benzene, 4-ethyl-1,2-dimethyl-	14.88	13	JN
08	768-49-0	Benzene, (2-methyl-1-propenyl)-	15.01	7.0	JN
09	824-90-8	1-Phenyl-1-butene	15.08	13	JN
10	1758-88-9	Benzene, 2-ethyl-1,4-dimethyl- $$ E	15.19	7.9	JN
11	488-23-3	Benzene, 1,2,3,4-tetramethyl-	15.25	9.4	JN
12	874-41-9	Benzene, 1-ethyl-2,4-dimethyl-	15.31	17	JN
13		UNKNOWN	15.57	6.9	J
14	824-22-6	1H-Indene, 2,3-dihydro-4-methyl- $$	15.64	16	JN
15	527-53-7	Benzene, 1,2,3,5-tetramethyl-	15.77	8.5	JN
16	934-10-1	3-Phenylbut-1-ene $$ 1-Methyl-2-pro	15.83	17	JN
17	119-64-2	Naphthalene, 1,2,3,4-tetrahydro-	16.05	9.3	JN
18		UNKNOWN	16.11	10	J
19		UNKNOWN	16.19	14	J
20	20836-11-7	2,2-Dimethylindene, 2,3-dihydro- $$	16.31	14	JN
21	2471-84-3	1H-Indene, 1-methylene- $$ 1-Methyl	16.66	54	JN
22	52161-57-6	Benzene, 1-methyl-3-(1-methyl-2-pro	16.97	10	JN
23	6682-71-9	1H-Indene, 2,3-dihydro-4,7-dimethyl	17.25	15	JN
24	90-12-0	Naphthalene, 1-methyl-	18.24	11	JN
25	91-57-6	Naphthalene, 2-methyl-	18.59	6.7	JN
26					
27					
28					
29					
30					
	E966796[1]	Total Alkanes	N/A	87	

[1]EPA-designated Registry Number.

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
B4TN2

Lab Name: COMPUCHEM Contract: EPW05028

Lab Code: LIBRTY Case No.: 37351 Mod. Ref No.: _____ SDG No.: B4TM7

Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: 0804014-06

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: 0804014-0691.d

Level: (TRACE/LOW/MED) LOW Date Received: 04/10/2008

% Moisture: not dec. _____ Date Analyzed: 04/16/2008

GC Column: SPB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Purge Volume: 5.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
75-71-8	Dichlorodifluoromethane	5.0	U
74-87-3	Chloromethane	5.0	U
75-01-4	Vinyl chloride	5.0	U
74-83-9	Bromomethane	5.0	U
75-00-3	Chloroethane	5.0	U
75-69-4	Trichlorofluoromethane	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U
67-64-1	Acetone	10 ~~8.0~~	~~J~~ U
75-15-0	Carbon disulfide	5.0	U
79-20-9	Methyl acetate	5.0	U
75-09-2	Methylene chloride	5.0	U
156-60-5	trans-1,2-Dichloroethene	5.0	U
1634-04-4	Methyl tert-butyl ether	5.0	U
75-34-3	1,1-Dichloroethane	5.0	U
156-59-2	cis-1,2-Dichloroethene	1.0	J
78-93-3	2-Butanone	10	U
74-97-5	Bromochloromethane	5.0	U
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
110-82-7	Cyclohexane	5.0	U
56-23-5	Carbon tetrachloride	5.0	U
71-43-2	Benzene	5.0	U
107-06-2	1,2-Dichloroethane	5.0	U
123-91-1	1,4-Dioxane	100	~~U~~

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
B4TN2

Lab Name: COMPUCHEM Contract: EPW05028

Lab Code: LIBRTY Case No.: 37351 Mod. Ref No.: _____ SDG No.: B4TM7

Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: 0804014-06

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: 0804014-0691.d

Level: (TRACE/LOW/MED) LOW Date Received: 04/10/2008

% Moisture: not dec. _____ Date Analyzed: 04/16/2008

GC Column: SPB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Purge Volume: 5.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
79-01-6	Trichloroethene	5.0	U
108-87-2	Methylcyclohexane	5.0	U J
78-87-5	1,2-Dichloropropane	5.0	U J
75-27-4	Bromodichloromethane	5.0	U J
10061-01-5	cis-1,3-Dichloropropene	5.0	U
108-10-1	4-Methyl-2-pentanone	10	U
108-88-3	Toluene	1.4	J
10061-02-6	trans-1,3-Dichloropropene	5.0	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	1.2	J
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	5.0	U
106-93-4	1,2-Dibromoethane	5.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	5.0	U
95-47-6	o-Xylene	1.6	J
179601-23-1	m,p-Xylene	2.6	J
100-42-5	Styrene	5.0	U
75-25-2	Bromoform	5.0	U
98-82-8	Isopropylbenzene	5.0	U
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U
541-73-1	1,3-Dichlorobenzene	5.0	U
106-46-7	1,4-Dichlorobenzene	5.0	U
95-50-1	1,2-Dichlorobenzene	5.0	U
96-12-8	1,2-Dibromo-3-chloropropane	5.0	U
120-82-1	1,2,4-Trichlorobenzene	5.0	U
87-61-6	1,2,3-Trichlorobenzene	5.0	U

1J - FORM I VOA-TIC
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
B4TN2

Lab Name: COMPUCHEM Contract: EPW05028

Lab Code: LIBRTY Case No.: 37351 Mod. Ref No.: SDG No.: B4TM7

Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: 0804014-06

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: 0804014-0691.d

Level: (TRACE or LOW/MED) LOW Date Received: 04/10/2008

% Moisture: not dec. Date Analyzed: 04/16/2008

GC Column: SPB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS:(ug/L or ug/kg) ug/L Purge Volume: 5.0 (mL)

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
01		UNKNOWN	13.72	8.6	J
02	526-73-8	Benzene, 1,2,3-trimethyl- $$ Hemime	14.05	7.5	JN
03	91-20-3	Naphthalene	16.66	9.9	JN
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30					
	E966796[1]	Total Alkanes	N/A		

[1]EPA-designated Registry Number.

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
B4TN3

Lab Name: COMPUCHEM Contract: EPW05028

Lab Code: LIBRTY Case No.: 37351 Mod. Ref No.: _____ SDG No.: B4TM7

Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: 0804014-07

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: 0804014-0791.d

Level: (TRACE/LOW/MED) LOW Date Received: 04/10/2008

% Moisture: not dec. _____ Date Analyzed: 04/16/2008

GC Column: SPB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: _____ (uL) Soil Aliquot Volume: _____ (uL)

Purge Volume: 5.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
75-71-8	Dichlorodifluoromethane	5.0	U
74-87-3	Chloromethane	5.0	U
75-01-4	Vinyl chloride	5.0	U
74-83-9	Bromomethane	5.0	U
75-00-3	Chloroethane	5.0	U
75-69-4	Trichlorofluoromethane	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U
67-64-1	Acetone	130	
75-15-0	Carbon disulfide	5.0	U
79-20-9	Methyl acetate	6.9	
75-09-2	Methylene chloride	5.0	U
156-60-5	trans-1,2-Dichloroethene	5.0	U
1634-04-4	Methyl tert-butyl ether	5.0	U
75-34-3	1,1-Dichloroethane	5.0	U
156-59-2	cis-1,2-Dichloroethene	4.1	J
78-93-3	2-Butanone	7.0	J
74-97-5	Bromochloromethane	5.0	U
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
110-82-7	Cyclohexane	1.9	J
56-23-5	Carbon tetrachloride	5.0	U
71-43-2	Benzene	2.9	J
107-06-2	1,2-Dichloroethane	5.0	U
123-91-1	1,4-Dioxane	100	U

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
B4TN3

Lab Name: COMPUCHEM Contract: EPW05028

Lab Code: LIBRTY Case No.: 37351 Mod. Ref No.: SDG No.: B4TM7

Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: 0804014-07

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: 0804014-0791.d

Level: (TRACE/LOW/MED) LOW Date Received: 04/10/2008

% Moisture: not dec. Date Analyzed: 04/16/2008

GC Column: SPB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 5.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
79-01-6	Trichloroethene	1.1	J
108-87-2	Methylcyclohexane	5.0	U
78-87-5	1,2-Dichloropropane	5.0	U
75-27-4	Bromodichloromethane	5.0	U
10061-01-5	cis-1,3-Dichloropropene	5.0	U
108-10-1	4-Methyl-2-pentanone	2.8	J
108-88-3	Toluene	18	
10061-02-6	trans-1,3-Dichloropropene	5.0	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	8.7	
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	5.0	U
106-93-4	1,2-Dibromoethane	5.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	13	
95-47-6	o-Xylene	34	
179601-23-1	m,p-Xylene	51	
100-42-5	Styrene	5.0	U
75-25-2	Bromoform	5.0	U
98-82-8	Isopropylbenzene	1.7	J
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U
541-73-1	1,3-Dichlorobenzene	5.0	U
106-46-7	1,4-Dichlorobenzene	0.75	J
95-50-1	1,2-Dichlorobenzene	5.0	U
96-12-8	1,2-Dibromo-3-chloropropane	5.0	U
120-82-1	1,2,4-Trichlorobenzene	5.0	U
87-61-6	1,2,3-Trichlorobenzene	5.0	U

1J - FORM I VOA-TIC
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
B4TN3

Lab Name: COMPUCHEM Contract: EPW05028

Lab Code: LIBRTY Case No.: 37351 Mod. Ref No.: SDG No.: B4TM7

Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: 0804014-07

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: 0804014-0791.d

Level: (TRACE or LOW/MED) LOW Date Received: 04/10/2008

% Moisture: not dec. Date Analyzed: 04/16/2008

GC Column: SPB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS: (ug/L or ug/kg) ug/L Purge Volume: 5.0 (mL)

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
01		UNKNOWN	13.69	25	J
02	526-73-8	Benzene, 1,2,3-trimethyl-	13.74	20	JN
03	611-14-3	Benzene, 1-ethyl-2-methyl-	13.93	11	JN
04	108-67-8	Benzene, 1,3,5-trimethyl-	14.05	46	JN
05	1758-88-9	Benzene, 2-ethyl-1,4-dimethyl-	14.53	14	JN
06	527-84-4	Benzene, 1-methyl-2-(1-methylethyl)	14.88	8.3	JN
07	1005-64-7	(E)-1-Phenyl-1-butene $$ Benzene,	15.08	9.5	JN
08	934-74-7	Benzene, 1-ethyl-3,5-dimethyl-	15.25	5.6	JN
09	76089-59-3	1,3-Cyclopentadiene, 1,2,3,4-tetra	15.31	10	JN
10	934-10-1	3-Phenylbut-1-ene $$ 1-Methyl-2-pr	15.64	9.6	JN
11	824-90-8	1-Phenyl-1-butene	15.83	13	JN
12	119-64-2	Naphthalene, 1,2,3,4-tetrahydro-	16.05	5.3	JN
13	4489-84-3	Benzene, (3-methyl-2-butenyl)-	16.31	7.4	JN
14	91-20-3	Naphthalene(1)	16.66	23	JN
15	91-57-6	Naphthalene, 2-methyl-	18.23	6.0	JN
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27					
28					
29					
30					
	E966796[1]	Total Alkanes	N/A	14	

[1]EPA-designated Registry Number.

1A - FORM I VOA-1
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
B4TZ7 TB

Lab Name: COMPUCHEM Contract: EPW05028

Lab Code: LIBRTY Case No.: 37351 Mod. Ref No.: SDG No.: B4TM7

Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: 0804014-08

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: 0804014-0891.d

Level: (TRACE/LOW/MED) LOW Date Received: 04/10/2008

% Moisture: not dec. Date Analyzed: 04/16/2008

GC Column: SPB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

Purge Volume: 5.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
75-71-8	Dichlorodifluoromethane	5.0	U
74-87-3	Chloromethane	5.0	U
75-01-4	Vinyl chloride	5.0	U
74-83-9	Bromomethane	5.0	U
75-00-3	Chloroethane	5.0	U
75-69-4	Trichlorofluoromethane	5.0	U
75-35-4	1,1-Dichloroethene	5.0	U
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.0	U
67-64-1	Acetone	14	
75-15-0	Carbon disulfide	5.0	U
79-20-9	Methyl acetate	5.0	U
75-09-2	Methylene chloride	0.60	JB
156-60-5	trans-1,2-Dichloroethene	5.0	U
1634-04-4	Methyl tert-butyl ether	5.0	U
75-34-3	1,1-Dichloroethane	5.0	U
156-59-2	cis-1,2-Dichloroethene	5.0	U
78-93-3	2-Butanone	10	U
74-97-5	Bromochloromethane	5.0	U
67-66-3	Chloroform	5.0	U
71-55-6	1,1,1-Trichloroethane	5.0	U
110-82-7	Cyclohexane	5.0	U
56-23-5	Carbon tetrachloride	5.0	U J
71-43-2	Benzene	5.0	U
107-06-2	1,2-Dichloroethane	5.0	U
123-91-1	1,4-Dioxane	100	U R

Report 1,4-Dioxane for Low-Medium VOA analysis only

1B - FORM I VOA-2
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
B4TZ7

Lab Name: COMPUCHEM
Contract: EPW05028
Lab Code: LIBRTY Case No.: 37351 Mod. Ref No.: SDG No.: B4TM7
Matrix: (SOIL/SED/WATER) WATER
Lab Sample ID: 0804014-08
Sample wt/vol: 5.00 (g/mL) mL
Lab File ID: 0804014-0891.d
Level: (TRACE/LOW/MED) LOW
Date Received: 04/10/2008
% Moisture: not dec.
Date Analyzed: 04/16/2008
GC Column: SPB-624 ID: 0.32 (mm)
Dilution Factor: 1.0
Soil Extract Volume: (uL)
Soil Aliquot Volume: (uL)
Purge Volume: 5.0 (mL)

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/kg) ug/L	Q
79-01-6	Trichloroethene	5.0	U
108-87-2	Methylcyclohexane	5.0	U
78-87-5	1,2-Dichloropropane	5.0	U
75-27-4	Bromodichloromethane	5.0	U
10061-01-5	cis-1,3-Dichloropropene	5.0	U
108-10-1	4-Methyl-2-pentanone	10	U
108-88-3	Toluene	5.0	U
10061-02-6	trans-1,3-Dichloropropene	5.0	U
79-00-5	1,1,2-Trichloroethane	5.0	U
127-18-4	Tetrachloroethene	5.0	U
591-78-6	2-Hexanone	10	U
124-48-1	Dibromochloromethane	5.0	U
106-93-4	1,2-Dibromoethane	5.0	U
108-90-7	Chlorobenzene	5.0	U
100-41-4	Ethylbenzene	5.0	U
95-47-6	o-Xylene	5.0	U
179601-23-1	m,p-Xylene	5.0	U
100-42-5	Styrene	5.0	U
75-25-2	Bromoform	5.0	U
98-82-8	Isopropylbenzene	5.0	U
79-34-5	1,1,2,2-Tetrachloroethane	5.0	U
541-73-1	1,3-Dichlorobenzene	5.0	U
106-46-7	1,4-Dichlorobenzene	5.0	U
95-50-1	1,2-Dichlorobenzene	5.0	U
96-12-8	1,2-Dibromo-3-chloropropane	5.0	U
120-82-1	1,2,4-Trichlorobenzene	5.0	U
87-61-6	1,2,3-Trichlorobenzene	5.0	U

1J - FORM I VOA-TIC
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
B4TZ7

Lab Name: COMPUCHEM Contract: EPW05028

Lab Code: LIBRTY Case No.: 37351 Mod. Ref No.: SDG No.: B4TM7

Matrix: (SOIL/SED/WATER) WATER Lab Sample ID: 0804014-08

Sample wt/vol: 5.00 (g/mL) mL Lab File ID: 0804014-0891.d

Level: (TRACE or LOW/MED) LOW Date Received: 04/10/2008

% Moisture: not dec. Date Analyzed: 04/16/2008

GC Column: SPB-624 ID: 0.32 (mm) Dilution Factor: 1.0

Soil Extract Volume: (uL) Soil Aliquot Volume: (uL)

CONCENTRATION UNITS: (ug/L or ug/kg) ug/L Purge Volume: 5.0 (mL)

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
01					
02					
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	E966796[1]	Total Alkanes	N/A		

[1]EPA-designated Registry Number.